ORDER NO. KM40102764C1

F11

Service Manual

Telephone Equipment

2 LINE

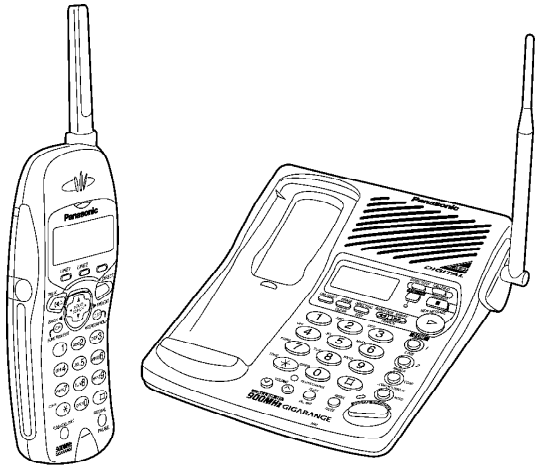
Caller ID Compatible

KX-TC1891B

900MHz Cordless Answering System

Black Version

(for U.S.A.)



(Handset) (Base Unit)

SPECIFICATIONS

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	Base Unit	Handset
Power Source:	AC Adaptor (PQLV1Z)	Rechargeable Ni-Cd battery
Receiving Frequency:	24 channels within 906.00~923.25 MHz	24 channels within 906.00~923.25 MHz
Receiving Method:	Double super heterodyne	Double super heterodyne
Transmitting Frequency:	24 channels within 906.00~923.25 MHz	24 channels within 906.00~923.25 MHz
Oscillation Method:	PLL synthesizer	PLL synthesizer
Tolerance of OSC Frequency:	24 MHz ± 72 Hz	24 MHz ± 72 Hz
Modulation Method:	NA (FSK/SS)	NA (FSK/SS)
Spread spectrum Method:	Direct sequence	Direct sequence
Chip rate	15 chip	15 chip
ID Code:	22-bit	22-bit
Dial Mode:	Tone (DTMF)/Pulse	Tone (DTMF)/Pulse
Redial:	Up to 32digits	Up to 32 digits
Speed Dialer:		Up to 48 digits
Power Consumption:		7 days at Standby, 4 hours at Talk
Dimension (H × W × D):	2 29/32" × 6 7/32" × 8 7/32" (74 × 175 × 209mm)	8 31/32" × 2 1/4" × 1 13/32" (228 × 57 × 36 mm)
Weight	1.10 lbs. (500 g)	0.46 lbs. (210g) with battery

Design and specifications are subject to change without notice.

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⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public.
It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

Panasonic

When you mention the serial number, write down all 11 digits. The serial number may be found on the label affixed to the bottom of the unit.

FOR SERVICE TECHNICIANS

ICs and LSIs are vulnerable to static electricity.
When replacing, the following precautions will help prevent recurring malfunctions.
1. Cover the plastic parts boxes with aluminum foil.
2. Ground the soldering irons.
3. Use a conductive mat on the work table.
4. Do not grasp IC or LSI pins with bare fingers.

1. STANDARD BATTERY LIFE

After your Panasonic battery is fully charged;

While in use (TALK)	**near the base unit***	**Up to about 6 hours**
	away from the base unit	**Up to about 4 hours**
While not in use (Stand-By)		**Up to about 14 days**

*** Within about 10 feet (3 m)**

• Battery life may be shortened depending on usage conditions, such as viewing the Caller ID Caller List, and ambient temperature.
• **Clean the handset and the base unit charge contacts with a soft, dry cloth. Clean if the unit is subject to grease, dust or high humidity.** Otherwise the battery may not charge properly.
• If the battery is fully charged, you do not have to place the handset on the base unit until "Recharge battery" is displayed and/or "[▮]" flashes. This will maximize the battery life.
• The battery cannot be overcharged.

Standby mode

Handset (While off the base unit)

The handset goes into the standby mode after you finish using the handset (marking/answering a call, viewing the Caller List or directory list etc.). The display is blank, but the handset can receive calls. The battery life is conserved in this mode.

Base Unit

The base unit goes into the standby mode after you finish using the base unit (marking/answering a call, using the intercom, using the answering system etc.). Programming is possible **only when** the base unit is in the standby mode.

Battery strength

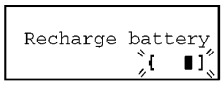
You can check the battery strength on the display while the handset is on the base unit, while it is in use (making/answering a call etc.), or after viewing the Caller List, or directory items, programming, etc.
The battery strength will remain on the display for a few seconds after using the handset, then the display will return to the standby mode.

The battery strength is as shown in the chart below.

Display prompt	Battery strength
[▮▮▮]	Fully charged
[▮▮]	Medium
[▮]	Low
[▮] (flashing)	Needs to be recharged.

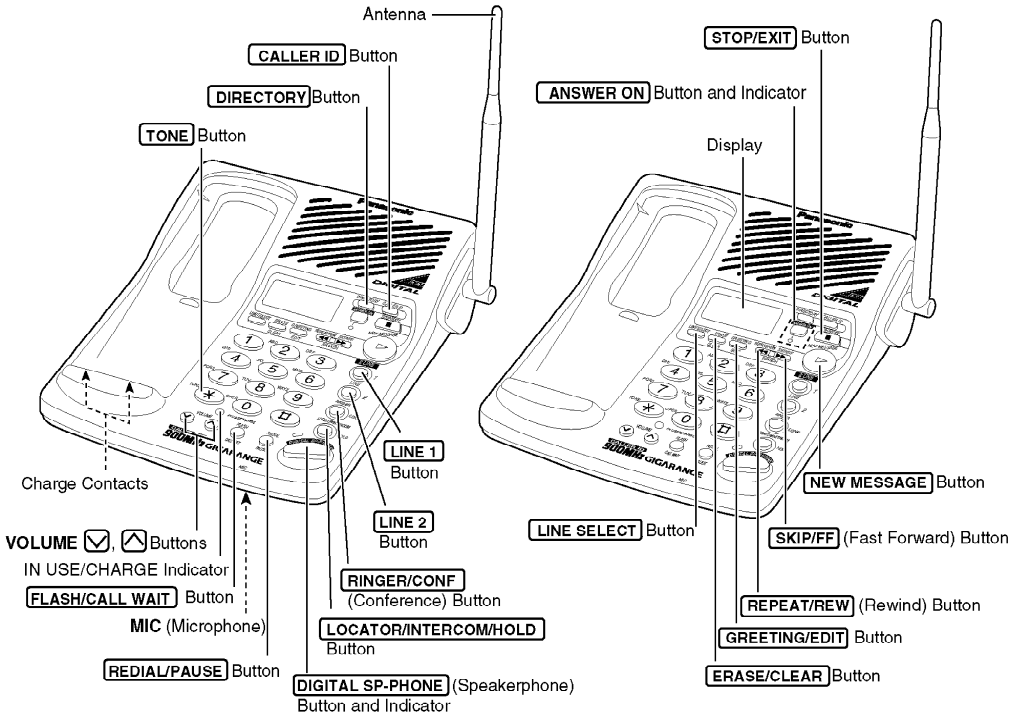
Recharge

Recharge the battery when:
– "Recharge battery" is displayed on the handset,
– "[▮]" flashes on the handset display, or
– The handset beeps intermittently while it is in use.

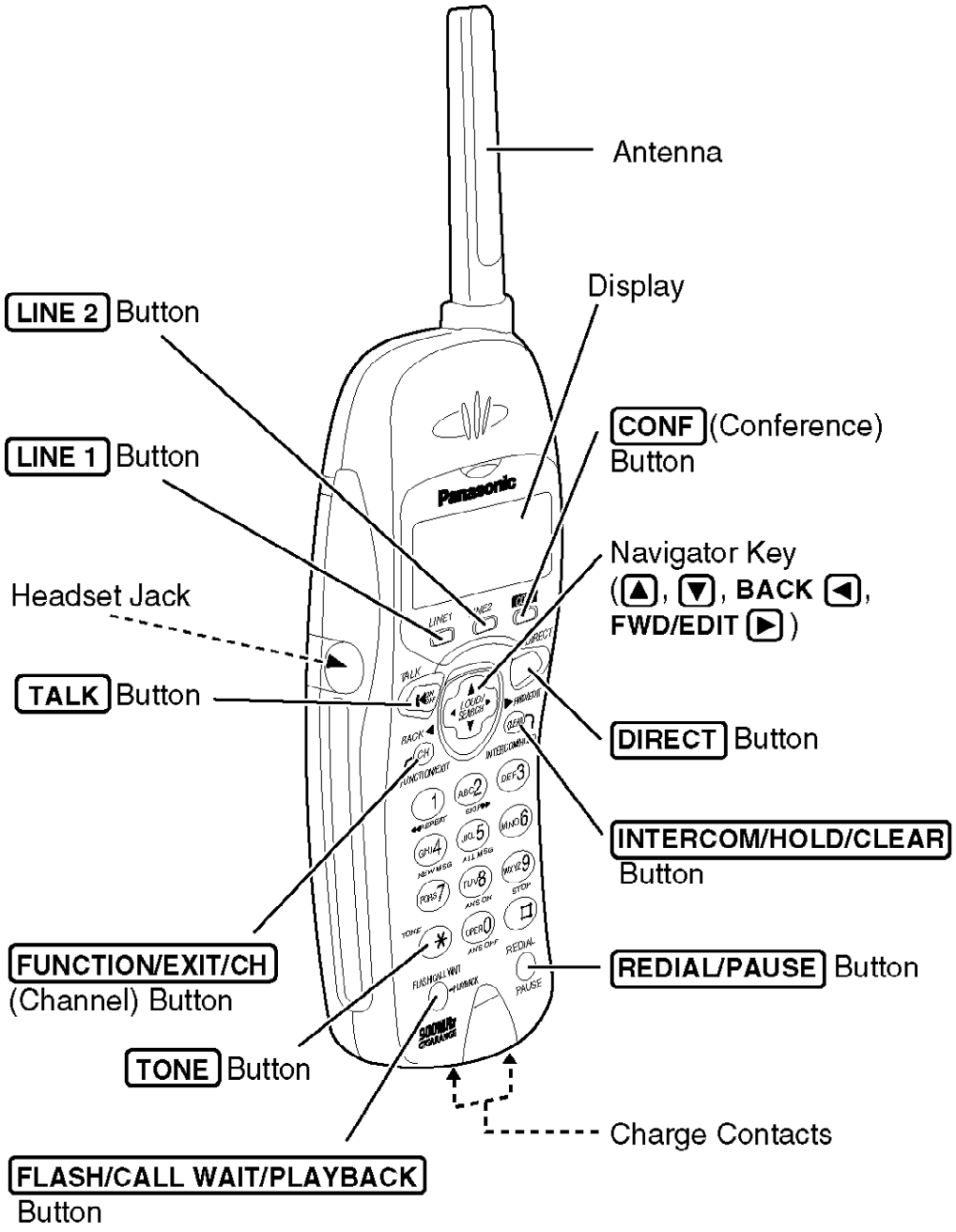


2. LOCATION OF CONTROLS

(Base unit)

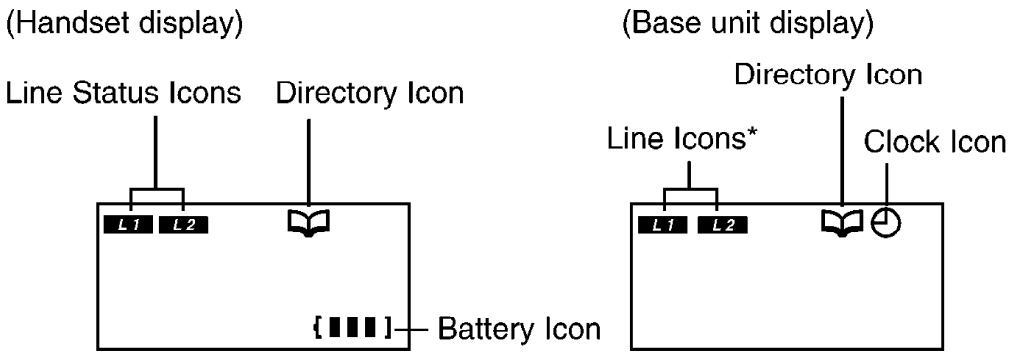

Antenna
CALLER ID Button
DIRECTORY Button
TONE Button
Charge Contacts
VOLUME ▽, △ Buttons
IN USE/CHARGE Indicator
FLASH/CALL WAIT Button
MIC (Microphone)
REDIAL/PAUSE Button
LINE 1 Button
LINE 2 Button
RINGER/CONF (Conference) Button
LOCATOR/INTERCOM/HOLD Button
DIGITAL SP-PHONE (Speakerphone) Button and Indicator
STOP/EXIT Button
ANSWER ON Button and Indicator
Display
NEW MESSAGE Button
LINE SELECT Button
SKIP/FF (Fast Forward) Button
REPEAT/REW (Rewind) Button
GREETING/EDIT Button
ERASE/CLEAR Button

(Handset)



3. DISPLAYS

Both the handset and the base unit show you instructions and information on their displays. These display prompts are shown below.

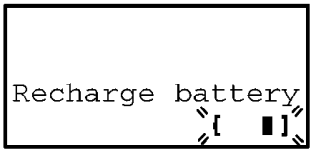
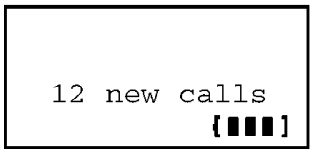
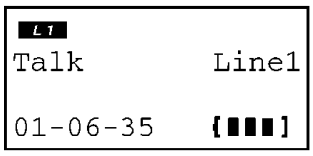
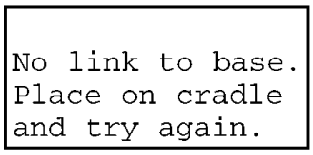
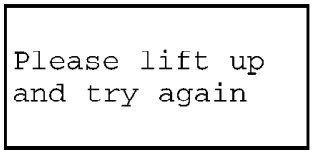
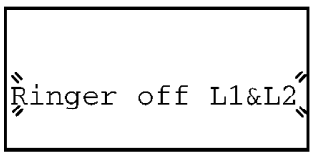
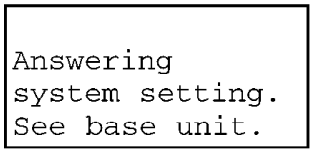
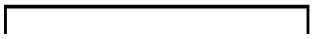


*The line icon(s) ("L1" and/or "L2") will be displayed when you operate the answering system on the line(s).

3.1. Common prompts for the handset and the base unit

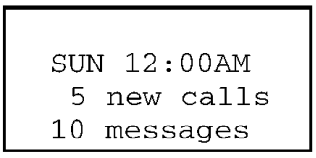
No items stored	The Caller List for both lines is empty or there are no stored items in the directory.
TINA ROBINSON 1-000-222-3333 1	When a call is received, the display shows the caller's name, number and the called line after the first ring. (The called line status icon flashes on the handset display.)
JACK SMITH 1-222-333-4444 1 11:20A JAN.12 x3	This is a name from the Caller List. The display shows: —the caller's name, —the caller's number and the called line, —the time and date of the last call (ex. Jan. 12, 11:20 AM), and —the number of times called (ex. 3 times).
Ann 1234567890	This is a name from the directory. The stored name and phone number are displayed.
NANCY BROWN 1-000-222-3333 1 ----Waiting-----	A second call is received during a conversation. (The called line status icon is displayed on the handset.)

3.2. Handset only

	The battery needs to be charged. Place the handset on the base unit to charge the battery.
	The display shows the number of new calls and the battery strength while the handset is on the base unit.
	The display shows the number of new calls when ▼ or ▲ is pressed while the handset is off the base unit. To search from the most recent call, press ▼. To search from the oldest call, press ▲. To go to the directory list, press **FWD/EDIT** ► (Directory key).
	During a conversation, the display shows the length of the call (ex. 1 hour, 6 minutes and 35 seconds). The battery strength is also displayed.
	The handset has lost communication with the base unit. Place the handset on the base unit and try again.
	▼, ▲, **BACK** ◄ or **FWD/EDIT** ► was pressed while the handset was on the base unit. Lift the handset and press the button again.
	When the ringer volume is set to OFF for both lines, "Ringer off L1&L2" will flash for about 45 seconds before the unit returns to the standby mode.
	When trying to store an item or Caller List information in the directory, the directory memory is full.
	▼, ▲, **BACK** ◄ or **FWD/EDIT** ► was pressed while the base unit was not in the standby or speakerphone mode.
	The unit is in answering system programming mode.
	The handset is operating the answering system

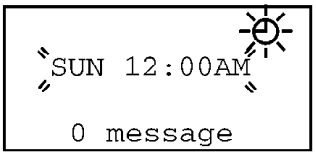
Remote operation	The handset is operating the answering system remotely.
Save error	During a programming procedure, the handset has lost communication with the base unit. Move closer to the base unit.

3.3. Base unit only

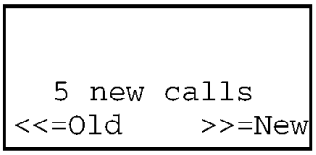


In the standby mode, the display shows the current day and time, the number of new calls and recorded messages for both lines.
(Ex. 5 new calls have been received and 10 messages have been recorded for both lines.)

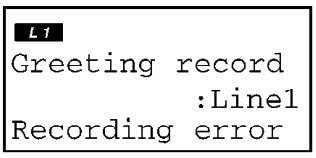
The line icon will flash:
–when the answering system is operating on a call,
–when the recorded messages on that line are being played.



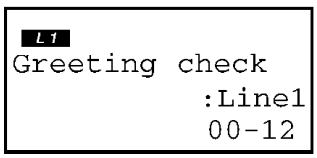
When the clock needs adjusting, the day and time flash.



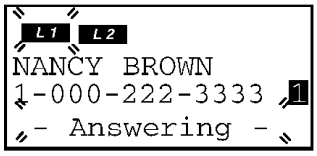
This display will be shown when **CALLER ID** is pressed. To search from the most recent call, press **SKIP/FF** (New key). To search from the oldest call, press **REPEAT/REW** (Old key).



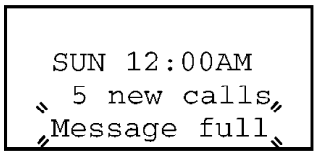
Your greeting message was not recorded correctly. Record it again.



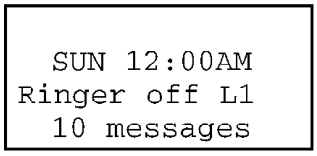
A greeting message is being played.
The display shows the elapsed time.



The answering system is recording a message. ("- Answering -" flashes.)
When the answering system is turned on, the corresponding line icon will flash.



Message memory is full. ("Message full" flashes.) Erase some or all of the messages.



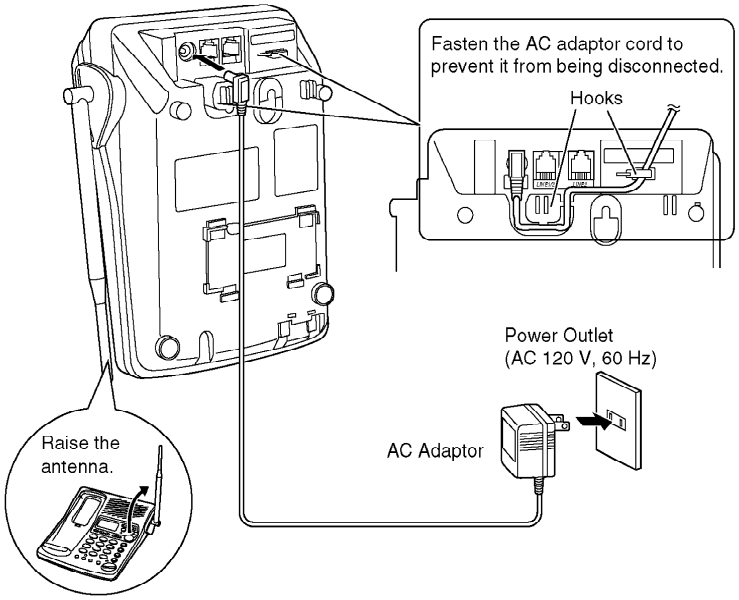
The ringer volume is set to OFF.

Handset in use

This display will be shown when the handset is used (viewing the Caller List or directory list, programming, etc.).

4. CONNECTIONS

Connecting the AC Adaptor


Fasten the AC adaptor cord to prevent it from being disconnected.
Hooks
Power Outlet
(AC 120 V, 60 Hz)
AC Adaptor
Raise the antenna.

Note:

- USE ONLY WITH Panasonic AC ADAPTOR PQLV1Z.

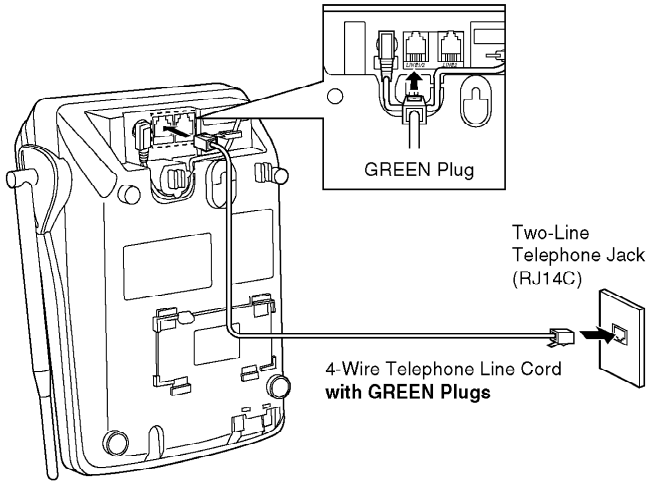
- The AC adaptor must remain connected at all times. (It is normal for the adaptor to feel warm during use.)

- If your unit is connected to a PBX which does not support Caller ID services, you cannot access those services.

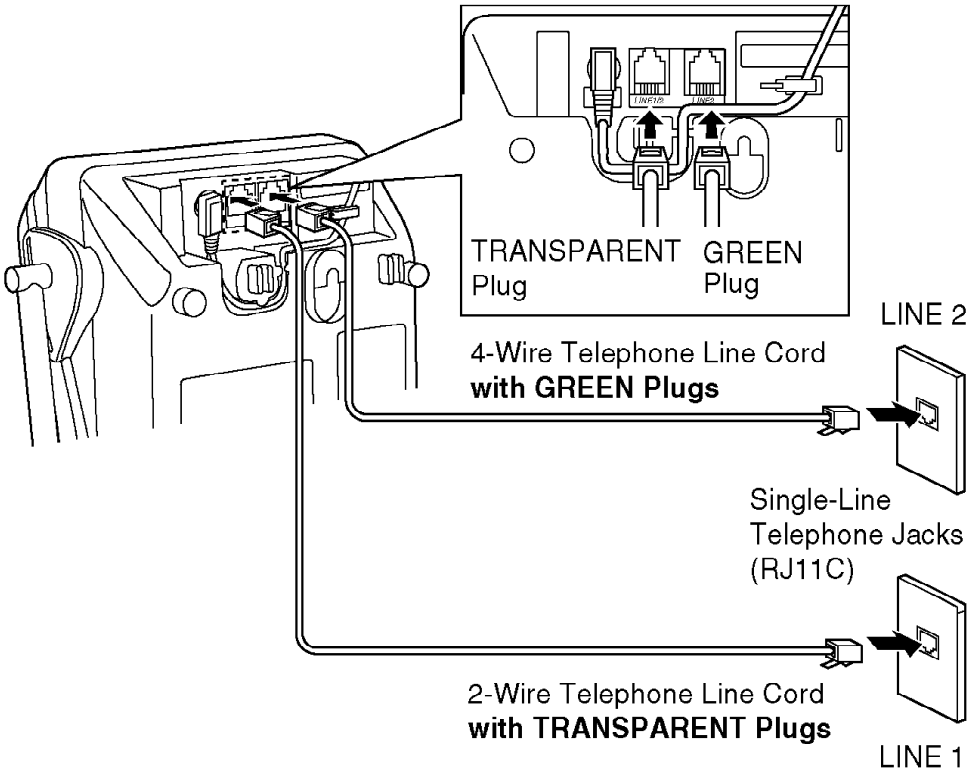
Connecting the Telephone Line Cord

Connect the telephone line cord(s) to the unit as follows.

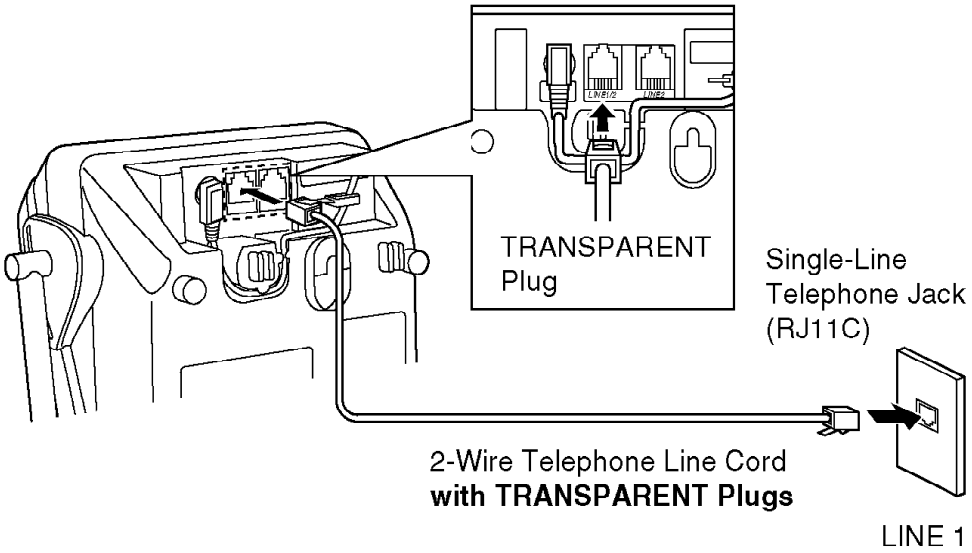
To connect a two-line telephone jack



To connect two single-line telephone jacks

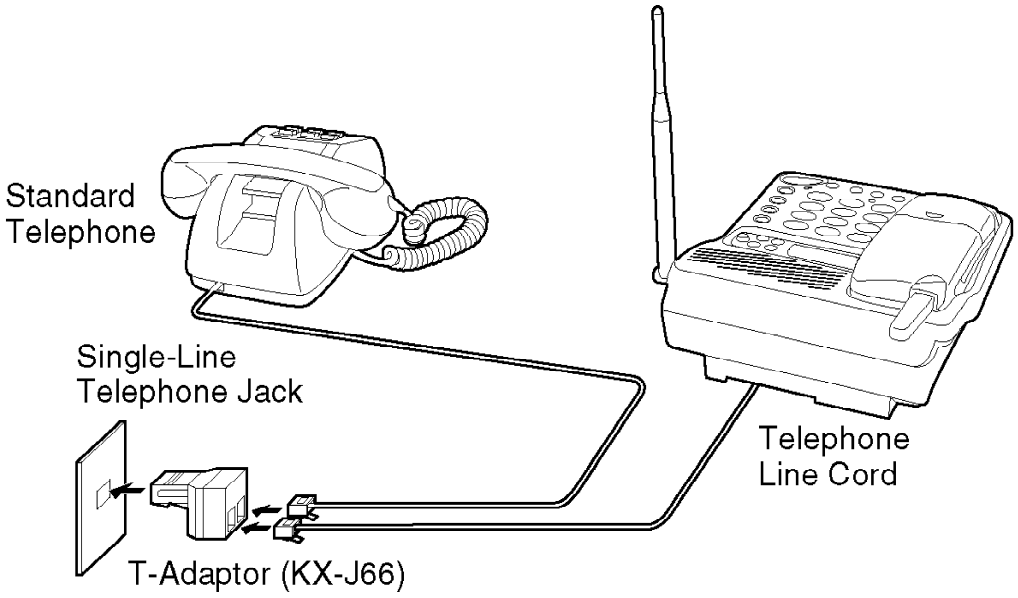


If you use the unit as a single-line telephone only



4.1. Adding Another Phone

This unit will not function during a power failure. To connect a standard telephone on the same line, use the Panasonic T-adaptor KX-J66.

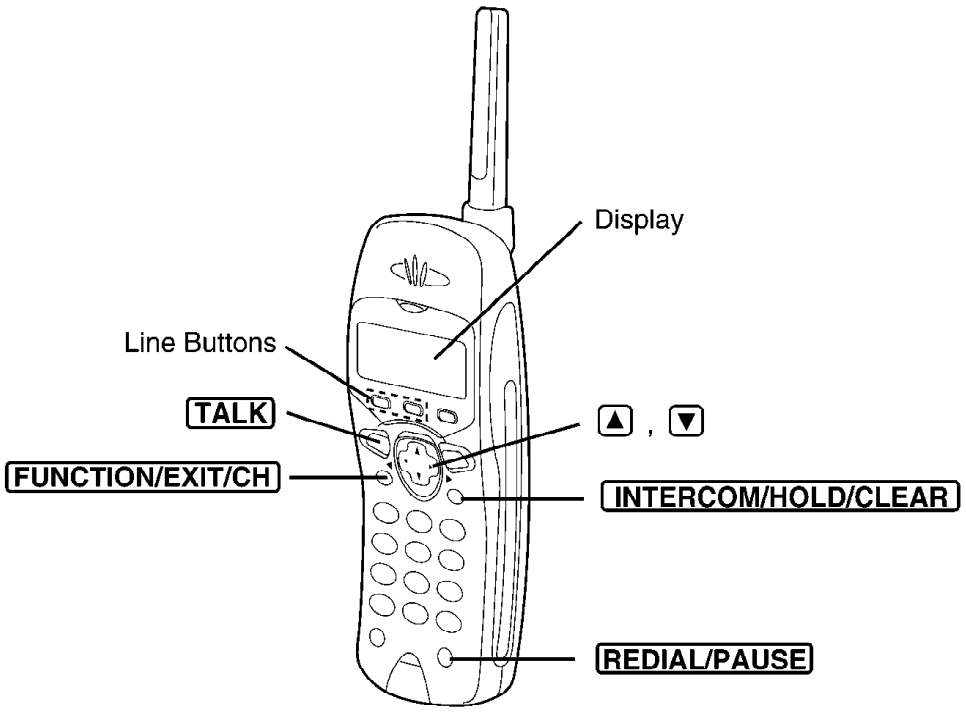


5. OPERATIONS

5.1. Making Calls

5.1.1. With the Handset

To have a hands-free conversation, connect an optional headset to the handset.

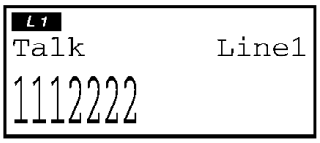


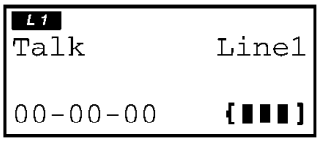
1 Press **TALK**.

- A free line is automatically selected and the line status icon is displayed.

2 Dial a phone number.

- The dialed number is displayed.
- After a few seconds, the display will show the length of the call and the battery strength.





3 To hang up, press **TALK** or place the handset on the base unit.

- The line status icon goes out.

- If "No link to base. Place on cradle and try again." is displayed and an alarm tone sounds in step 1, move closer to the base unit or place the handset on the base unit, and try again.
- In step 1, you may select a line manually by pressing the line button instead of **TALK**.

If noise interferes with the conversation

Press [FUNCTION/EXIT/CH] to select a clearer channel or move closer to the base unit.

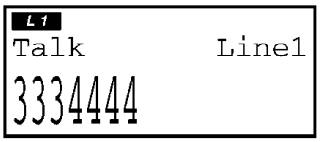
To redial the last number dialed on the handset

Press [TALK] or a line button ➡ [REDIAL/PAUSE].

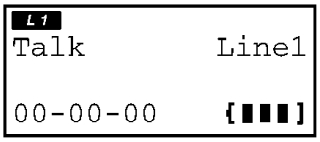
To dial after confirming the entered number

1 Dial a phone number.
- If you misdial, press [INTERCOM/HOLD/CLEAR]. All digits are erased. Dial the correct phone number.

2 Press [TALK] or a line button.
- After a few seconds, the display will show the length of the call and the battery strength.



3 To hang up, press [TALK] or place the handset on the base unit.



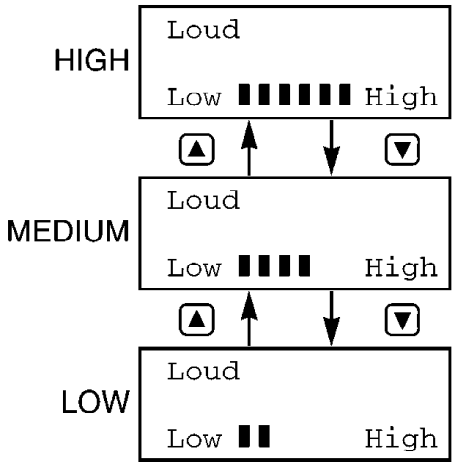
To redial after confirming the last number dialed

Press [REDIAL/PAUSE] ➡ [TALK] or a line button.

To select the receiver volume

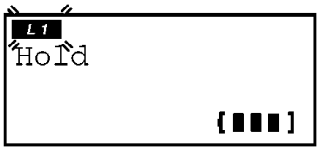
Press [▲] or [▼] while talking.
- Each time you press [▲] or [▼], the volume level will change.
- The display will return to the length of the call.
- Your phone comes from the factory set to MEDIUM.

- When you replace the battery, the selected receiver volume setting will return to the factory set (MEDIUM). Reprogram if necessary.



To put a call on hold

Press **INTERCOM/HOLD/CLEAR**.



- "Hold" is displayed.
- The called line status icon on the handset and the called line button on the base unit flash.

To release the hold

Press the line button on the handset whose status icon is flashing or the line button on the base unit which is flashing.

- If another phone is connected on the same line, you can also release the hold by lifting its handset.

Backlit LCD display

The lighted handset display will stay on for about a few seconds after pressing a handset button, lifting the handset off the base unit, hanging up a call, leaving the programming mode or ending the intercom.

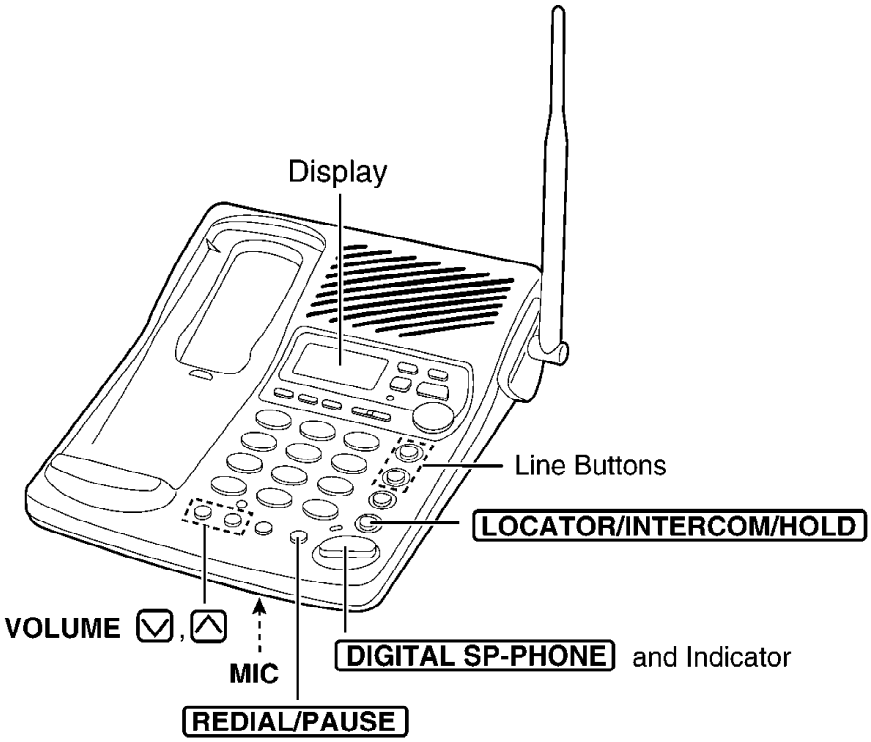
Lighted handset keypad

The handset dialing buttons will light when you press a button or lift the handset off the base unit, and flash when a call is received.
The lights will go out about a few seconds after pressing a button, lifting the handset, answering a call, hanging up a call, leaving the programming mode or ending the intercom.

What the line status icons ("L1" and "L2") on the display mean (Handset)

Off	The line is free.
On	You are using the line on the handset, base unit or parallel connected telephone.
Flashing	A call is on hold. The answering system is operating on a call.
Flashing quickly	A call is being received.

5.1.2. With the Base Unit (DIgital Duplex Speakerphone)



1 Press **DIGITAL SP-PHONE**.

- The DIGITAL SP-PHONE indicator lights.
- A free line is automatically selected and the line button lights.

```
Talk          Line1
```

2 Dial a phone number.

- After a few seconds, the display will show the length of the call.

```
Talk          Line1
1112222
```

3 When the other party answers, talk into the **MIC** (microphone).

```
Talk          Line1
00-00-00
```

4 To hang up, press **DIGITAL SP-PHONE**.

- The indicator and the line button lights go out.

- To switch to the handset while using the speakerphone:
  —If the handset is off the base unit, press the line button on the handset whose status icon is flashing.
  —If on the base unit, just lift up.
- During a call using the handset, the call can be switched to the speakerphone by pressing the base unit's line button for the line which is being used on the handset.
- The line button shows the line status.
- In step 1, you may select a line manually by pressing the line button instead of **DIGITAL SP-PHONE**.

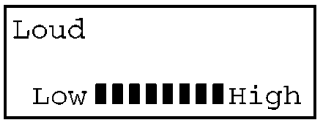
Hands-free Digital Speakerphone

For best performance, please note the following:

- Talk alternately with the caller in a quiet room.
- If the other party has difficulty hearing you, press **VOLUME** ▽ to decrease the speaker volume.
- If the other party's voice from the speaker cuts in/out during a conversation, press **VOLUME** ▽ to decrease the speaker volume.

To adjust the speaker volume (8 levels) while talking

To increase, press **VOLUME** △.
To decrease, press **VOLUME** ▽.



To redial the last number dialed on the base unit

Press **DIGITAL SP-PHONE** or a line button ➡ **REDIAL/PAUSE**.

To put a call on hold

Press **LOCATOR/INTERCOM/HOLD**.

- The DIGITAL SP-PHONE indicator goes out, and the called line button on the base unit and the called line status icon on the handset flash.

To release the hold

Press the line button on the base unit which is flashing or the line button on the handset whose status icon is flashing.

- If another phone is connected on the same line, you can also release the hold by lifting its handset.

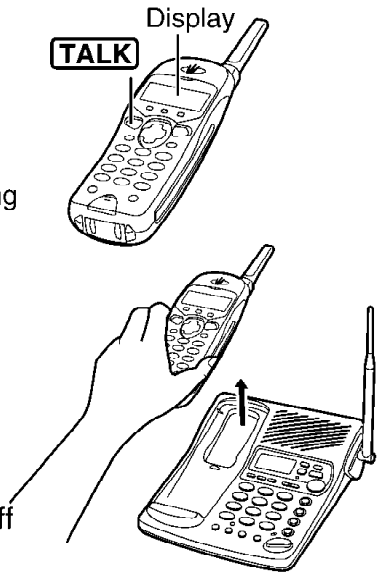
What the line buttons mean (Base unit)

Off	The line is free.
On	You are using the line on the base unit.
Flashing twice every 2 seconds	Someone else is using the line on the handset or parallel connected telephone.
Flashing	A call is on hold. The answering system is operating on a call.
Flashing quickly	A call is being received.

5.2. Answering Calls

When a call is received, the unit rings, "Incoming call" and the called line are displayed on the unit. The called line status icon on the handset and the called line button on the base unit flash quickly. The line is automatically selected when you answer the call.
If you subscribe to a Caller ID service, the calling party information will be displayed after the first ring. In order to view the Caller ID information, please wait until the second ring to answer a call.

5.2.1. With the Handset



Lift the handset off the base unit and press TALK.

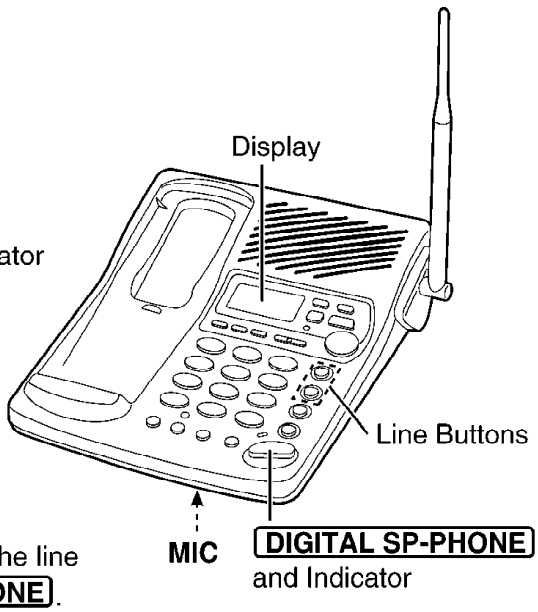
- The called line status icon stops flashing.
- You can also answer a call by pressing any dialing button 0 to 9, * or # (—**Any Key Talk**).
- You may answer a call by pressing the line button instead of TALK.
- When the ringer volume is set to "OFF", the selected line(s) will not ring.

Auto Talk

If you set the Auto Talk feature to ON, you can answer a call by lifting the handset off the base unit without pressing TALK.

When the headset is connected, make sure to use the headset to talk with the caller. If you want to have a normal cordless phone conversation, disconnect the headset.

5.2.2. With the Base Unit



1 Press DIGITAL SP-PHONE.
- The DIGITAL SP-PHONE indicator and the line button light.

2 Talk into the **MIC**.

3 To hang up, press DIGITAL SP-PHONE.

- You may answer a call by pressing the line button instead of DIGITAL SP-PHONE.
- When the ringer volume is set to "OFF", the selected line(s) will not ring.

5.3. Automatic Answering Operation

When the unit answers a call, a greeting message is played and the caller's message is recorded. While recording, "– Answering –" will flash.

- The total recording time (including greeting message) is **about 15 minutes**. If messages are recorded in noisy rooms, the time may be shortened by up to 3 minutes.
- A maximum of 64 messages (including greeting message) can be recorded.

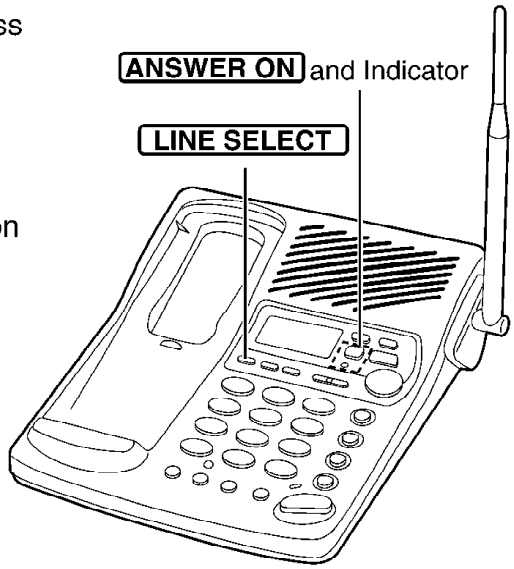
5.3.1. Setting the Unit to Answer Calls

1 a) To turn on the answering system **on both lines**, press LINE SELECT repeatedly until "L1 L2" is displayed.

b) To turn on the answering system **on either line**, press LINE SELECT repeatedly until "L1" or "L2" is displayed.

2 Press ANSWER ON to turn on the answering system.

- The ANSWER ON indicator lights.
- "Answer set" and the selected line(s) will be announced.



- If another button is pressed between steps 1 and 2, the selected line(s) may not be turned on.
- The unit will announce the remaining recording time if it is less than 5 minutes.
- If you hear "Memory full", "Message full" is displayed on the base unit and the ANSWER ON indicator flashes rapidly, erase some, or all, of the messages.
- You can also turn on the answering system remotely using any other phone.

To turn off the answering system

Press ANSWER ON.

- The ANSWER ON indicator light goes out and "Answer off" is heard.
- To turn off the answering system on either line when both lines are turned on, press LINE SELECT repeatedly until the line which you want to leave on is

[redacted]

Monitoring incoming calls

While a call is being recorded, you can monitor it through the speaker. To answer the call with the speakerphone, press the line button which is flashing on the base unit. For the handset, press the line button whose status icon is displayed. The unit stops recording.

5.4. Listening to Messages

You can see the total number of recorded messages on the base unit display. If the ANSWER ON indicator flashes, new messages have been recorded.

Listening to only new messages

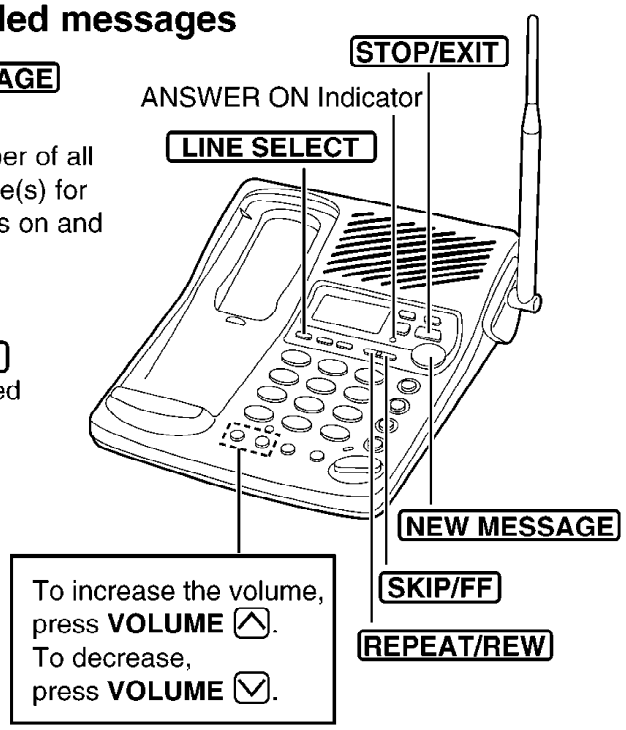
Press **NEW MESSAGE** briefly.

- The unit announces the number of new messages on the line(s) for which the answering system is on and plays them back.
- To listen to new messages on either or both line(s), press **LINE SELECT** repeatedly to select the desired line(s), then press **NEW MESSAGE** briefly.

Listening to all recorded messages

Press and hold **NEW MESSAGE** until playback starts.

- The unit announces the number of all recorded messages on the line(s) for which the answering system is on and plays them back.
- To listen to all recorded messages on either or both line(s), press **LINE SELECT** repeatedly to select the desired line(s), then press and hold **NEW MESSAGE** until playback starts.



- During playback, the display shows which message is being played. (Ex. While the first message is being played back, "Message 1" is displayed.)
- At the end of the last message, "End of final message" is heard. The unit will announce the remaining recording time if it is less than 5 minutes.

When the answering system for both lines is turned on:

- The messages are played back from the oldest on both lines.
- The corresponding line icon will flash when a message on that line is being played.

5.4.1. During playback

To **repeat/ rewind** message	**To repeat from the beginning of the message** Press [REPEAT/REW] briefly. • If you press within 5 seconds of playback, the previous message will be played. **To rewind part of the message** Press and hold [REPEAT/REW] until you reach the desired place. • At the beginning of the message, 3 beeps will sound.
To **skip/cue** message	**To skip to the next message** Press [SKIP/FF] briefly. **To cue to part of the message** Press and hold [SKIP/FF] until you reach the desired place. • The message will be heard at twice the normal speed. • At the end of the message, 3 beeps will sound.
To **stop** operation	Press [STOP/EXIT]. • To resume playback, press [NEW MESSAGE]. • If you do not press any button for 60 seconds or if you press [STOP/EXIT] again, the unit will return to the standby mode.

For Caller ID service users

• During playback, the base unit display will show the name and/or number of the caller whose message is being played.

To call back the displayed number:

During playback, lift the handset and press [TALK] within 10 seconds, or press [DIGITAL SP-PHONE].

—The unit stops playback and automatically dials the displayed phone number.

• After listening to new incoming messages, "✓" will be added to the call entries in the Caller ID Caller List.

6. DISASSEMBLY INSTRUCTIONS

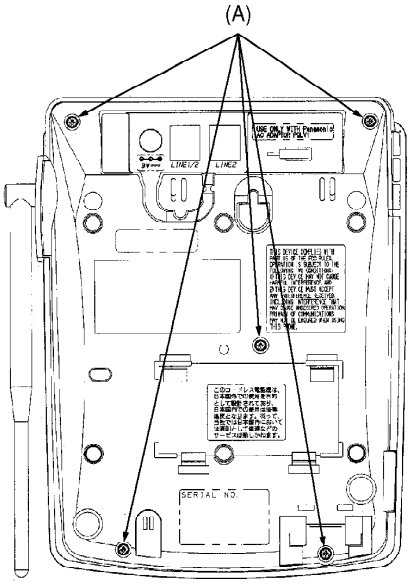


Fig. 1

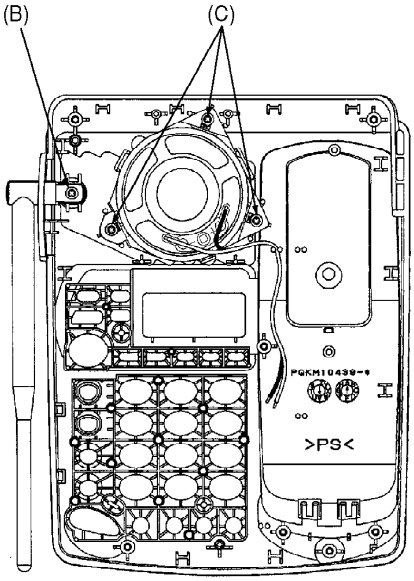


Fig. 3

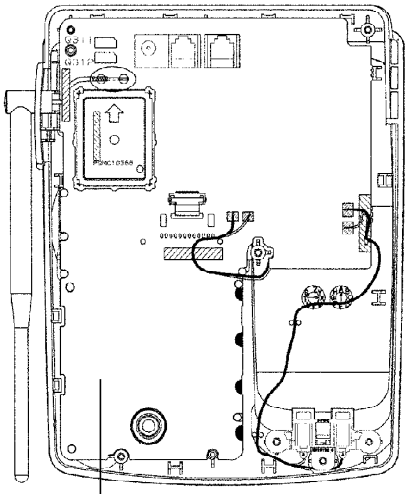


Fig. 2

Remove the
P. C. Board

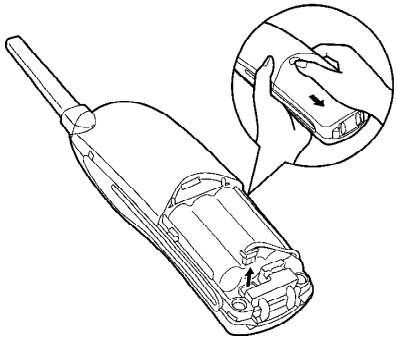


Fig. 4

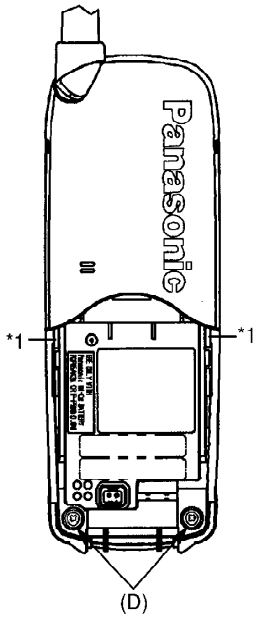


Fig. 5

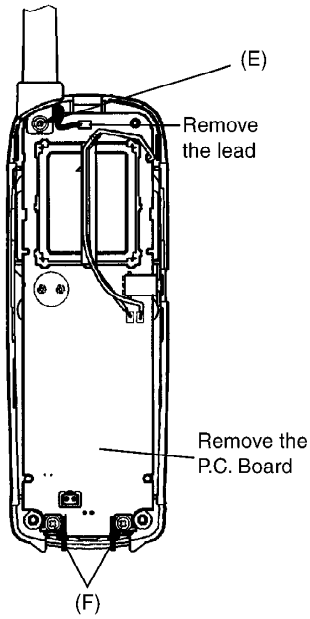


Fig. 6

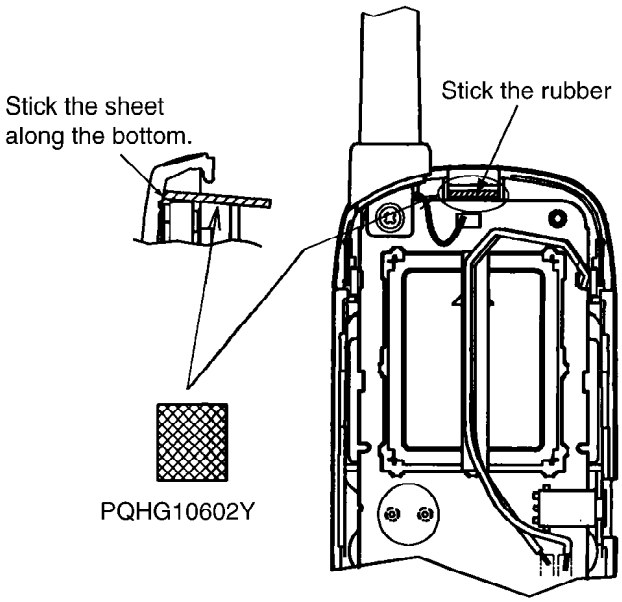
Shown in Fig.-	To Remove	Remove
1	Lower Cabinet	Screws (2.6 X 12).....(A) X 5
2	Main P.C. Board	Remove the P.C. Board
3	Antenna	Screw (3 X 12).....(B) X 1
	Speaker	Screws (3 X 8).....(C) X 3
4	Battery Cover	Remove the Battery Cover
5	Rear Cabinet	Screws (2.6 X 12).....(D) X 2
6	Main P.C. Board	Screw (2.6 X 12).....(E) X 1
		Screws (2.6 X 8).....(F) X 2
		Remove the lead
		Remove the P.C. Board

Note

***1 — After removing 2 screws (D), insert a (-) driver into *1 and pull it outside of the cabinet.**

6.1. Adjustment to prevent the cabinet from opening at dropping

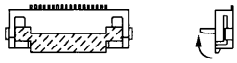
Stick the two sheets and the rubber on the front cabinet as shown in the figure to prevent the cabinet from opening at dropping.



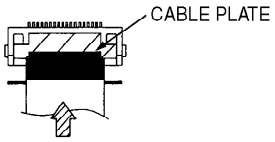
7. ASSEMBLY INSTRUCTIONS

7.1. Assembly the LCD to P.C. Board (Base Unit)

1. Open the lid of the connector to upper side.



2. Insert the LCD cable through the hole of P.C. Board. (See Fig. 7.)



3. Close the lid of connector.

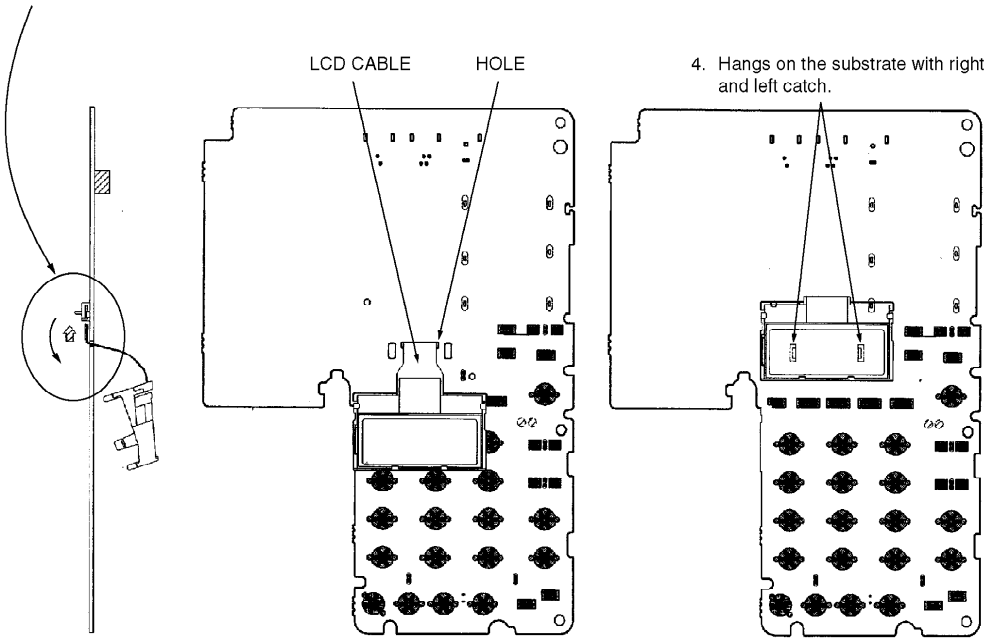
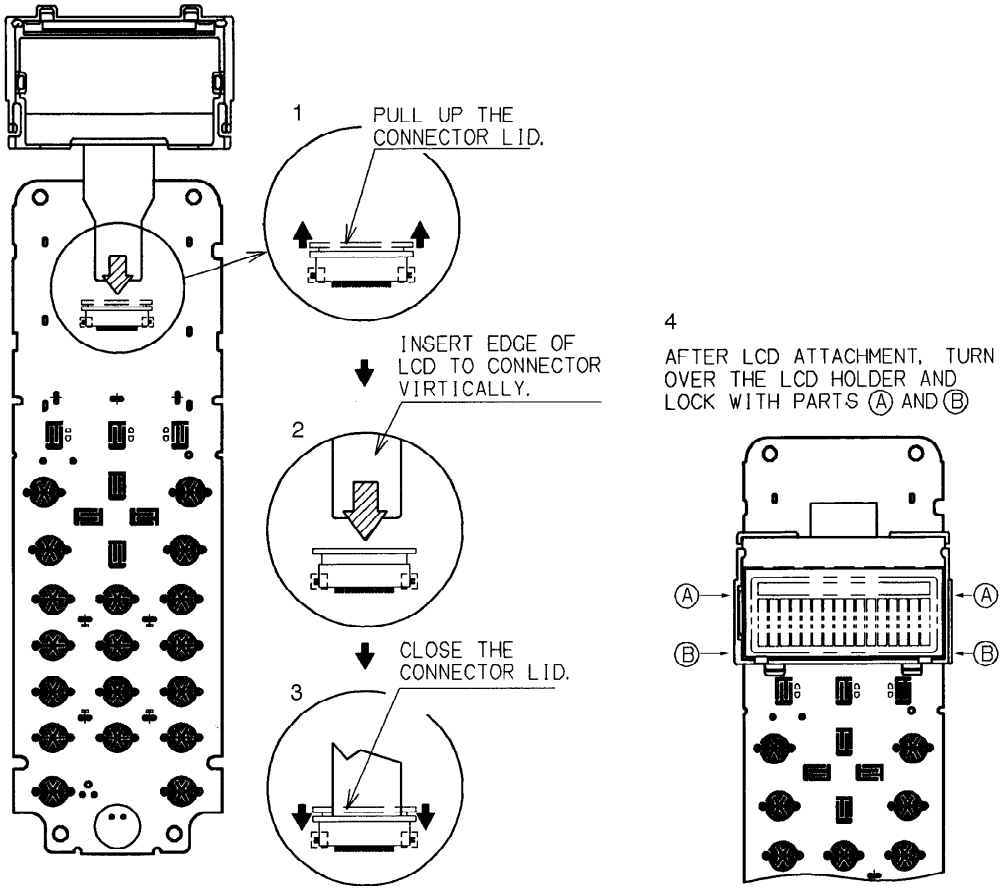


Fig. 7

7.2. Assembly the LCD to P.C. Board (Handset)

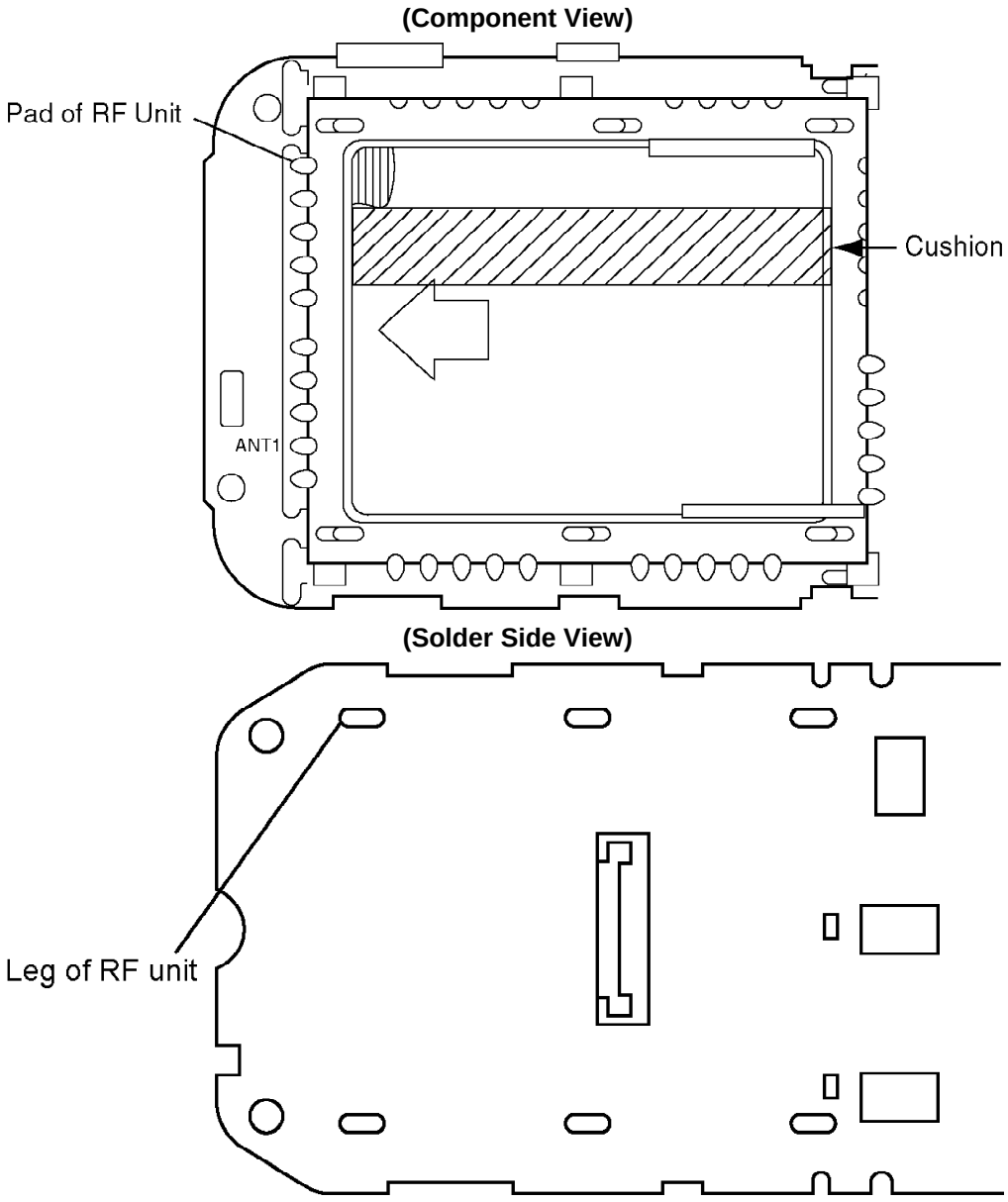


7.3. Replace the RF unit

For HS

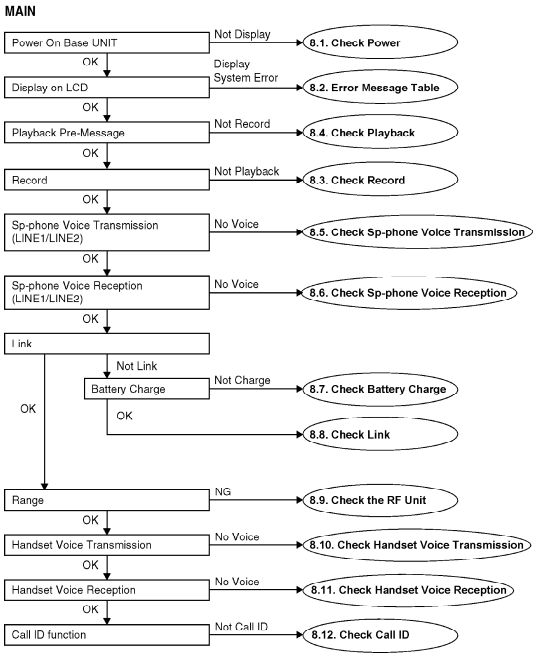
Follow this procedure below when replacing HS RF unit.

1. **Remove speaker cables of LCD unit on HS main board. And remove LCD unit.**
2. **Remove solder on six legs of RF unit.**
3. **Remove solder on all pads of RF unit.**
4. **Replace defective RF unit with new HS RF unit.**
   NOTE:
   Do not use BU RF unit for HS one.
   HS RF unit is different from BU one.
5. **Solder all pads of RF unit.**
6. **Solder six RF legs.**
7. **Put LCD unit and solder speaker wire.**
   NOTE:
   Speaker wire has polarity.



8. TROUBLESHOOTING GUIDE

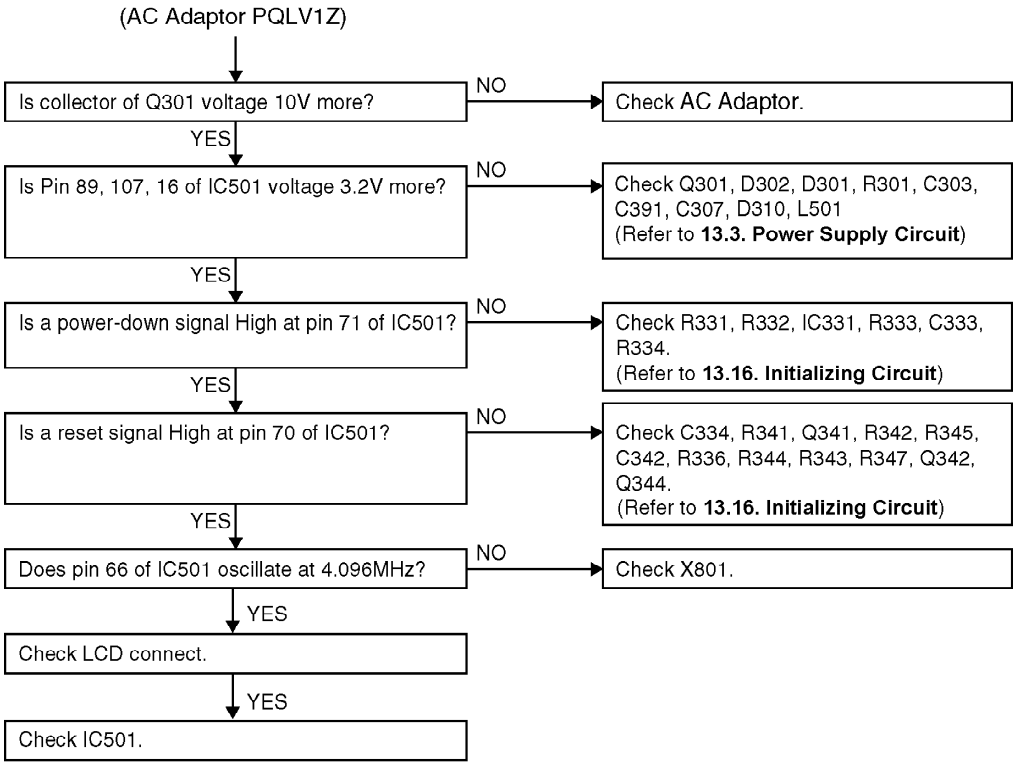
Below main flow chart shows the basic check procedure, right side each item (8.1. ~ 8.12.) is corresponded to detailed each item from next page.



8.1. Check Power

BASE UNIT

Is the AC Adaptor inserted into 120V outlet?


(AC Adaptor PQLV1Z)
Is collector of Q301 voltage 10V more?
NO
Check AC Adaptor.
YES
Is Pin 89, 107, 16 of IC501 voltage 3.2V more?
NO
Check Q301, D302, D301, R301, C303, C391, C307, D310, L501
(Refer to 13.3. Power Supply Circuit)
YES
Is a power-down signal High at pin 71 of IC501?
NO
Check R331, R332, IC331, R333, C333, R334.
(Refer to 13.16. Initializing Circuit)
YES
Is a reset signal High at pin 70 of IC501?
NO
Check C334, R341, Q341, R342, R345, C342, R336, R344, R343, R347, Q342, Q344.
(Refer to 13.16. Initializing Circuit)
YES
Does pin 66 of IC501 oscillate at 4.096MHz?
NO
Check X801.
YES
Check LCD connect.
YES
Check IC501.

8.2. Error Message Table

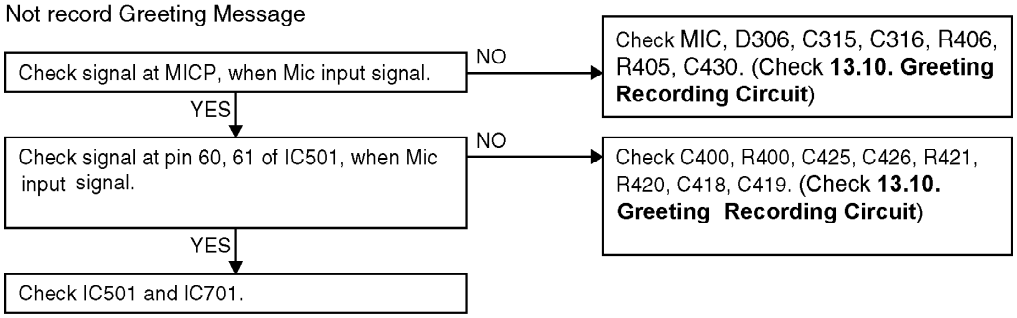
Display	Symptom	Remedy
System error 1	The initialization was tried, but it could not be done.	1. Confirm Flash Memory is equipped. 2. Confirm the connection of Flash Memory. 3. Confirm the power supply of Flash Memory. When no error is found in above-mentioned items, Flash Memory has a defect. Replace Flash Memory.
System error 2	The defect of Flash Memory was detected.	When Flash Memory has the fatal detect, replace Flash Memory. This error hardly occurs.
System error 3 System error 9	When the adjustment data was checked, an error was detected. (The adjustment data may not be written.)	1. Confirm Flash Memory is equipped. 2. Confirm the connection of Flash Memory. 3. Confirm the power supply of Flash Memory. When no error is found in above-mentioned items, Flash Memory has a defect. Replace Flash Memory.
System error 4	The defect of DSP was detected. (The chip in DSP may have a defect.)	1. Confirm the connection of DSP. 2. Confirm the oscillation frequency of DSP. When no error is found in above-mentioned items, DSP has a defect. Replace DSP.
System error 5 System error 6	The defect of DSP was detected.	When DSP has the fatal defect, replace DSP. This error hardly occurs.
System error 7	The defect of synthesized voice was detected. (The synthesized voice may not be written.)	1. Confirm Flash Memory is equipped. 2. Confirm the connection of Flash Memory. 3. Confirm the power supply of Flash Memory. When no error is found in above-mentioned items, Flash Memory has a defect. Replace Flash Memory.

NOTE:
Flash memory is IC701. DSP is IC501.

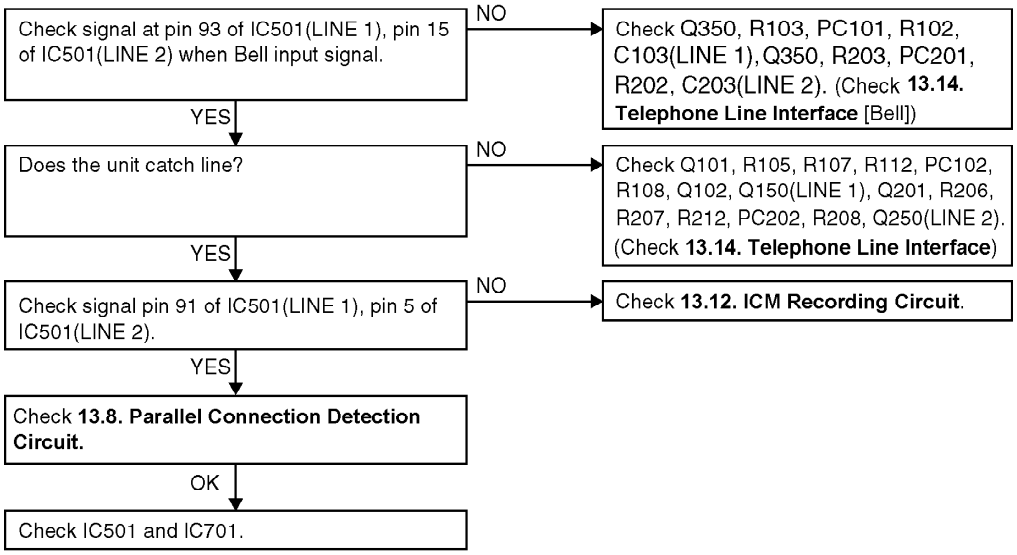
8.3. Check Record

BASE UNIT

Not record Greeting Message

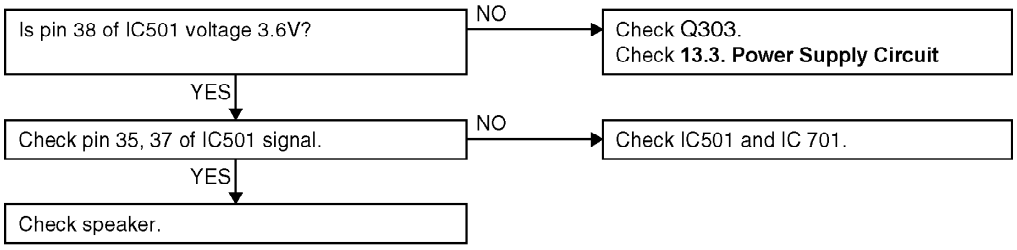

Check signal at MICP, when Mic input signal.
NO
Check MIC, D306, C315, C316, R406, R405, C430. (Check 13.10. Greeting Recording Circuit)
YES
Check signal at pin 60, 61 of IC501, when Mic input signal.
NO
Check C400, R400, C425, C426, R421, R420, C418, C419. (Check 13.10. Greeting Recording Circuit)
YES
Check IC501 and IC701.

Not record Incoming Message


Check signal at pin 93 of IC501(LINE 1), pin 15 of IC501(LINE 2) when Bell input signal.
NO
Check Q350, R103, PC101, R102, C103(LINE 1), Q350, R203, PC201, R202, C203(LINE 2). (Check 13.14. Telephone Line Interface [Bell])
YES
Does the unit catch line?
NO
Check Q101, R105, R107, R112, PC102, R108, Q102, Q150(LINE 1), Q201, R206, R207, R212, PC202, R208, Q250(LINE 2). (Check 13.14. Telephone Line Interface)
YES
Check signal pin 91 of IC501(LINE 1), pin 5 of IC501(LINE 2).
NO
Check 13.12. ICM Recording Circuit.
YES
Check 13.8. Parallel Connection Detection Circuit.
OK
Check IC501 and IC701.

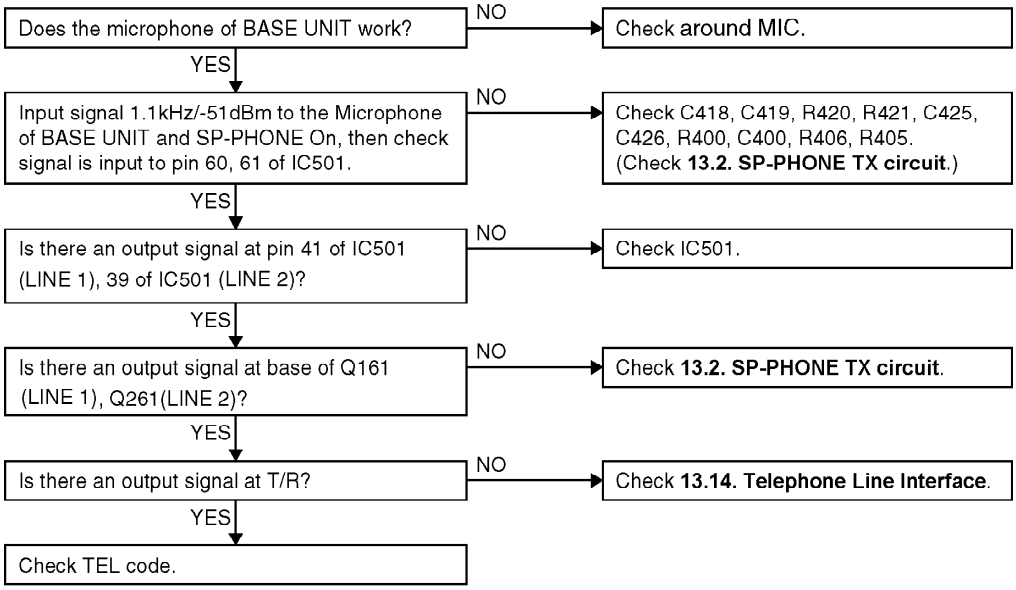
8.4. Check Playback

BASE UNIT



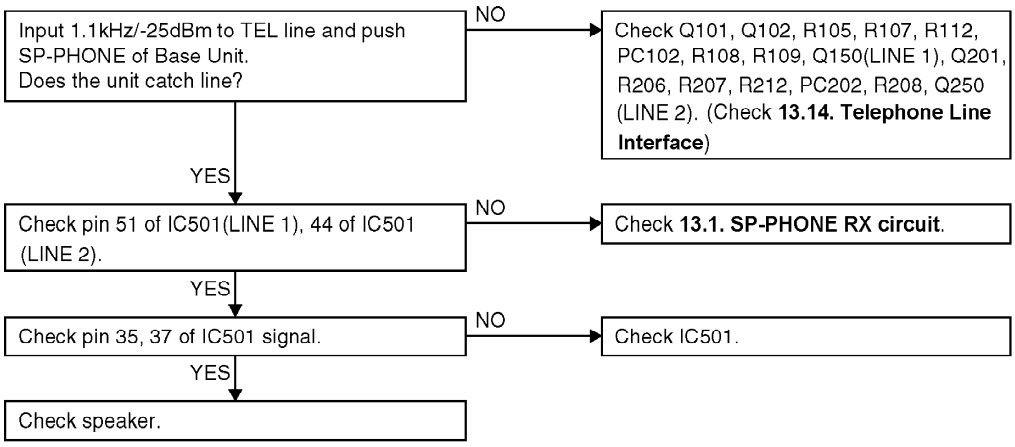
8.5. Check Sp-phone Voice Transmission

BASE UNIT

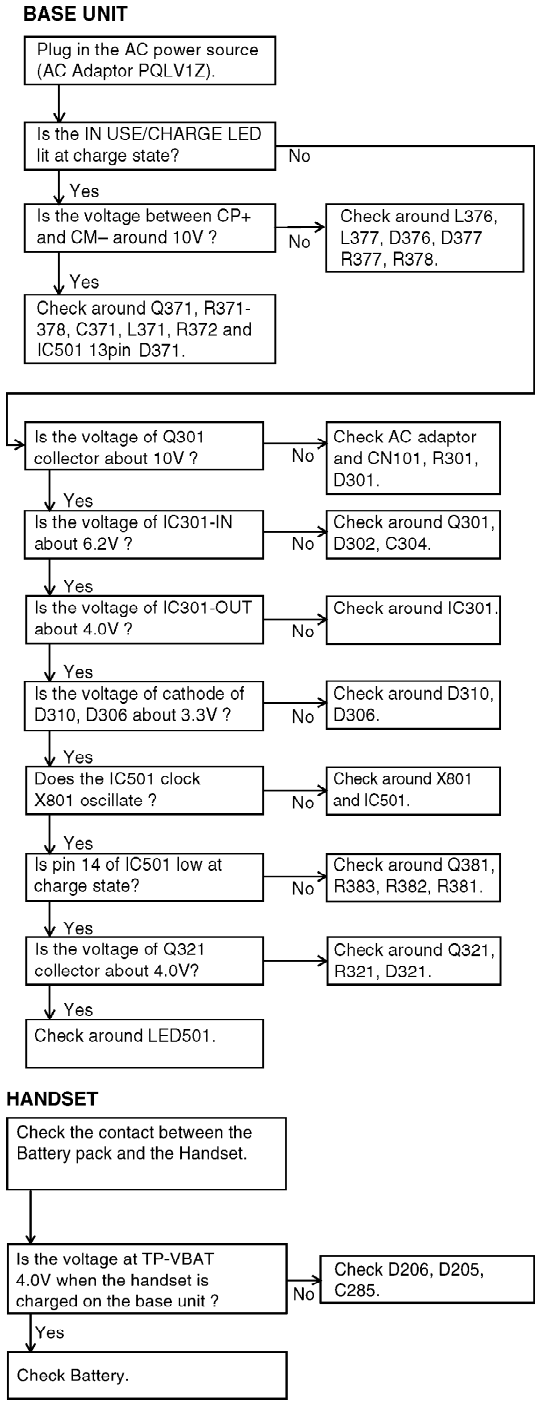

Does the microphone of BASE UNIT work?
NO
Check around MIC.
YES
Input signal 1.1kHz/-51dBm to the Microphone of BASE UNIT and SP-PHONE On, then check signal is input to pin 60, 61 of IC501.
NO
Check C418, C419, R420, R421, C425, C426, R400, C400, R406, R405. (Check 13.2. SP-PHONE TX circuit.)
YES
Is there an output signal at pin 41 of IC501 (LINE 1), 39 of IC501 (LINE 2)?
NO
Check IC501.
YES
Is there an output signal at base of Q161 (LINE 1), Q261(LINE 2)?
NO
Check 13.2. SP-PHONE TX circuit.
YES
Is there an output signal at T/R?
NO
Check 13.14. Telephone Line Interface.
YES
Check TEL code.

8.6. Check Sp-phone Voice Reception

BASE UNIT


Input 1.1kHz/-25dBm to TEL line and push SP-PHONE of Base Unit. Does the unit catch line?
NO
Check Q101, Q102, R105, R107, R112, PC102, R108, R109, Q150(LINE 1), Q201, R206, R207, R212, PC202, R208, Q250 (LINE 2). (Check 13.14. Telephone Line Interface)
YES
Check pin 51 of IC501(LINE 1), 44 of IC501 (LINE 2).
NO
Check 13.1. SP-PHONE RX circuit.
YES
Check pin 35, 37 of IC501 signal.
NO
Check IC501.
YES
Check speaker.

8.7. Check Battery Charge

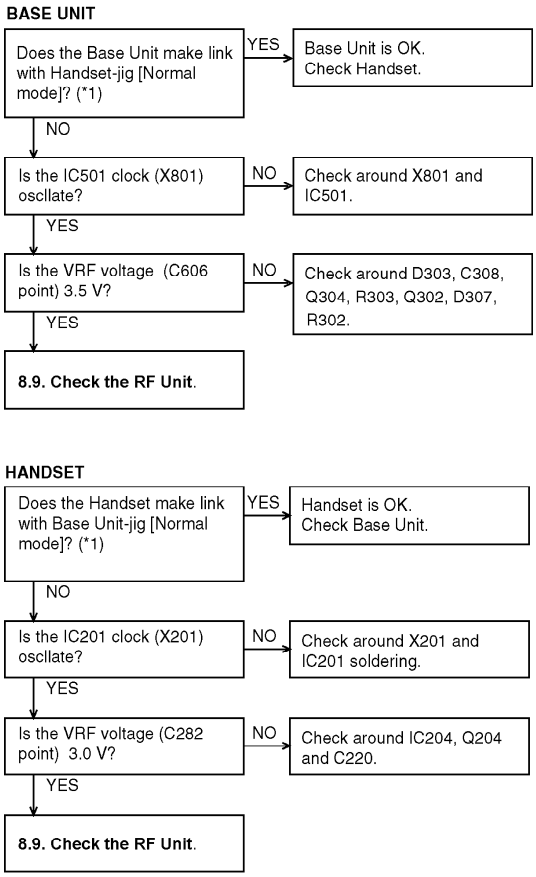

BASE UNIT
Plug in the AC power source (AC Adaptor PQLV1Z).
Is the IN USE/CHARGE LED lit at charge state?
No
Yes
Is the voltage between CP+ and CM– around 10V ?
No
Check around L376, L377, D376, D377 R377, R378.
Yes
Check around Q371, R371-378, C371, L371, R372 and IC501 13pin D371.
Is the voltage of Q301 collector about 10V ?
No
Check AC adaptor and CN101, R301, D301.
Yes
Is the voltage of IC301-IN about 6.2V ?
No
Check around Q301, D302, C304.
Yes
Is the voltage of IC301-OUT about 4.0V ?
No
Check around IC301.
Yes
Is the voltage of cathode of D310, D306 about 3.3V ?
No
Check around D310, D306.
Yes
Does the IC501 clock X801 oscillate ?
No
Check around X801 and IC501.
Yes
Is pin 14 of IC501 low at charge state?
No
Check around Q381, R383, R382, R381.
Yes
Is the voltage of Q321 collector about 4.0V?
Check around Q321, R321, D321.
Yes
Check around LED501.
HANDSET
Check the contact between the Battery pack and the Handset.
Is the voltage at TP-VBAT 4.0V when the handset is charged on the base unit ?
No
Check D206, D205, C285.
Yes
Check Battery.

Note

- CP+/CM-: Refer to Base Unit Reference Drawing.

- TP-VBAT: Refer to Handset Reference Drawing.

8.8. Check Link


BASE UNIT
Does the Base Unit make link with Handset-jig [Normal mode]? (*1)
YES
Base Unit is OK. Check Handset.
NO
Is the IC501 clock (X801) osclIate?
NO
Check around X801 and IC501.
YES
Is the VRF voltage (C606 point) 3.5 V?
NO
Check around D303, C308, Q304, R303, Q302, D307, R302.
YES
8.9. Check the RF Unit.
HANDSET
Does the Handset make link with Base Unit-jig [Normal mode]? (*1)
YES
Handset is OK. Check Base Unit.
NO
Is the IC201 clock (X201) osclIate?
NO
Check around X201 and IC201 soldering.
YES
Is the VRF voltage (C282 point) 3.0 V?
NO
Check around IC204, Q204 and C220.
YES
8.9. Check the RF Unit.

(*1) Refer to "Finding out the Defective Unit"

8.9. Check the RF Unit

8.9.1. Finding out the Defective Unit

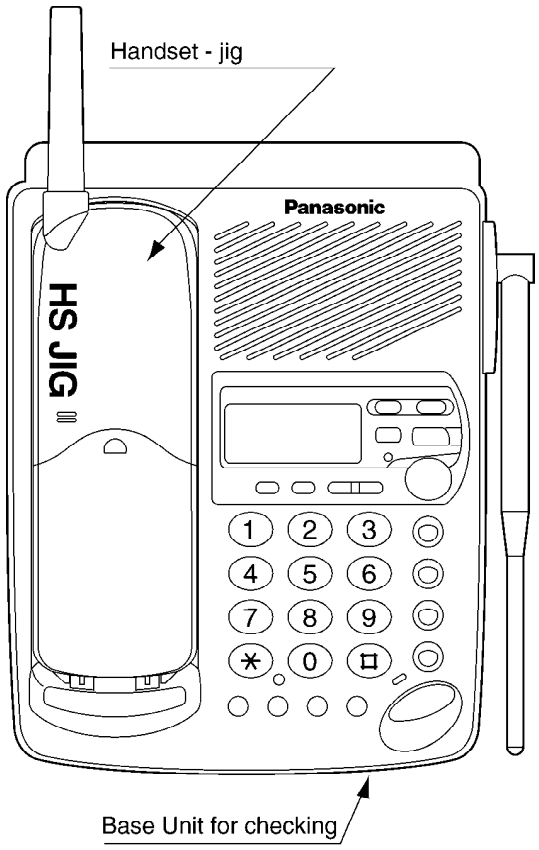
Prepare HS JIG (Handset-jig) and BS JIG (Base Unit-jig). Place the HS JIG on the cradle of the base unit for checking, then confirm that they are linked. Place the handset for checking on the cradle of the BS JIG, then confirm that they are linked. How to confirm the link is as follows; press the TALK button and confirm that the LEDs of the base unit is turned ON.

8.9.2. Check Items

8.9.2.1. Handset-jig (HS JIG) for Base Unit

The handset unit jig also uses two modes: TEST SUPER LOW mode and NORMAL POWER mode. These modes alternate when the handset CLEAR button is pressed:
(1) NORMAL POWER mode (Stand-By). In this mode the LCD will remain blank.
(2) TEST SUPER LOW mode. When the CLEAR button is pressed, the LCD will show TEST SUPER LOW. This test simulates the handset is at very large distance from the base unit and the TX signal from handset to base is very small.
Procedure: First place handset jig on base under test to charge (exchange security code); press CLEAR and then TALK to operate. The LCD will show TALK and TEST. This means that the base unit sensitivity is OK.
*** In TALK mode, LCD display change to “TALK TEST” or “TALK” on [TEST POWER] mode or [NORMAL POWER] mode.**
*** HS JIG becomes [NORMAL POWER] mode immediately after the power supply turning on.**

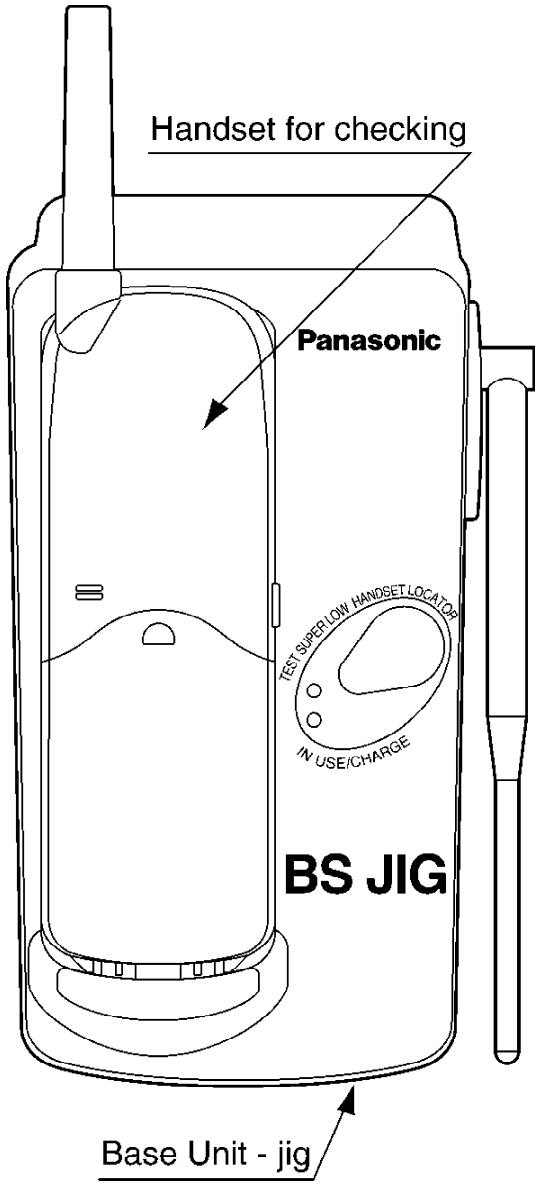
NOTES:
1) If when setting the handset to TEST SUPER LOW mode, if handset beeps 3 times and the LCD shows "No link to base. Place on cradle and try again", press 2, 5, 8, 0 simultaneously and then disconnect battery. Re-install battery, place unit on cradle to get security codes and tries again.
2) Only KX-TC1851B with marks HS JIG can be used for troubleshooting. Regular KX-TC1851B production samples does not have the software needed for troubleshooting.
3) You can differentiate the jig from a regular unit because the jig has silver bottom cabinet (base) and back cabinet (handset).



8.9.2.2. Base Unit - jig (BS JIG) for Handset

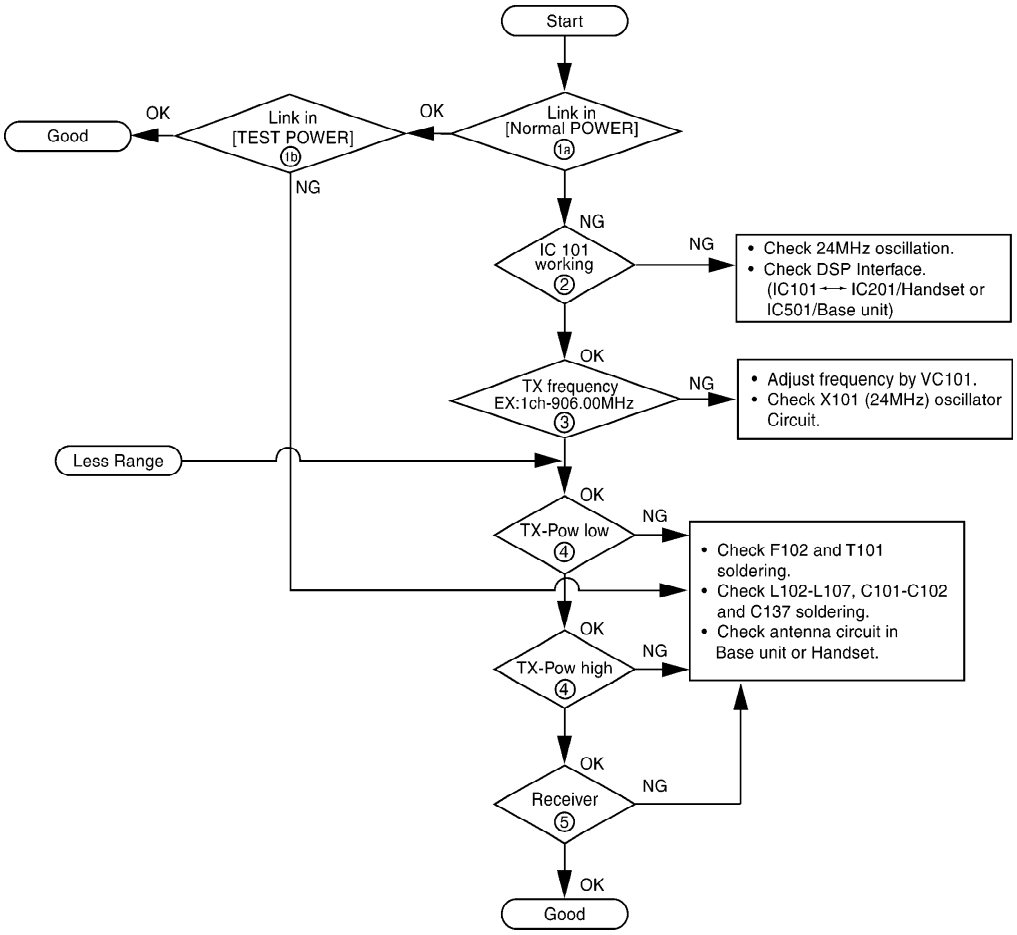
The base unit jig uses two modes: NORMAL POWER mode and TEST POWER mode. These modes alternate when the base unit LOCATOR button is pressed:
(1) NORMAL POWER mode, TEST SUPER LOW (red) is OFF. This test simulates the handset is at normal/close distance. The base unit is in NORMAL POWER mode right after the AC adapter has been inserted.
(2) TEST SUPER LOW (POWER) mode, TEST SUPER LOW LED (red) is ON. This test simulates the handset is at very large distance from the base unit and the TX signal from base to handset is very small.
Procedure: First, place handset under test to charge (exchange security code), then remove handset from base after you hear a beep; press LOCATOR on base unit (red LED lights). Press TALK button on handset and if it links with the base, then this handset sensitivity is OK.
*** BS JIG becomes [NORMAL POWER] mode immediately after the power supply turning on.**
NOTES:
1) If when setting the base to TEST SUPER LOW mode, if handset beeps 3 times and the LCD

shows "No link to base. Place on cradle and try again", press 2, 5, 8, 0 simultaneously and then disconnect battery. Re-install battery, place unit on cradle to get security codes and tries again.
2) Only KX-TC1851B with marks BS JIG can be used for troubleshooting. Regular KX-TC1851B production samples does not have the software needed for troubleshooting.
3) You can differentiate the jig from a regular unit because the jig has silver bottom cabinet (base) and back cabinet (handset).



8.9.3. RF Check Flowchart

Each item (1a ~ 5) of RF check flowchart is corresponded to Check Table for RF Block. Please refer each item one by one.



(*) Details of confirmation items are following in "Check Table for RF Block".

8.9.4. Check Table for RF Block

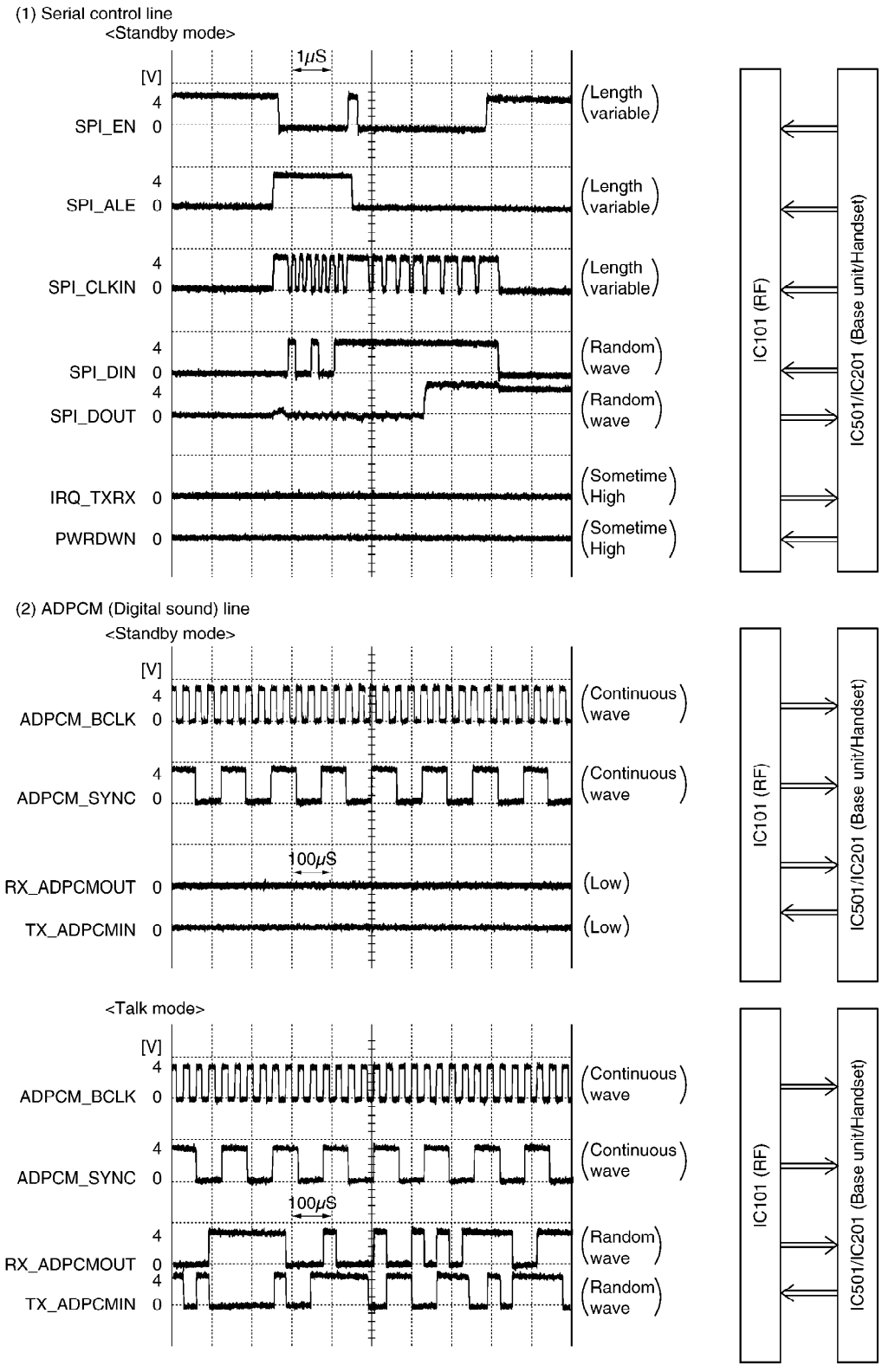
No	Item		BS (Base unit) (*1)	HS (Handset) (*1)
1a.	Link confirmation [NORMAL POWER]	Procedure	1. Put "HS JIG" on BS. 2. Set MODE to [NORMAL POWER] position of "HS JIG". 3. Press [TALK] key of "HS JIG" to establish link.	1. Put HS on "BS JIG". 2. Set MODE to [NORMAL POWER] positi JIG". 3. Press [TALK] key of "HS" to establish
1b.	Link confirmation [TEST POWER]	Procedure	1. Change MODE to [TEST POWER] position of "HS JIG". 2. Press [TALK] key of "HS JIG" to establish link about 30cm away from "BS".	1. Change MODE to [TEST POWER] posit JIG". 2. Press [TALK] key of "HS" to establish 30cm away from "BS JIG".
2	IC101 working confirmation	Procedure	1. Set Test-mode [Continuos Send Low Power].(*3) 2. Confirm X101 oscillate(24MHz). (*4)	1. Set Test-mode [Continuos Send Low P 2. Confirm X101 oscillate(24MHz) (*4).
		Check point	1. Check X101 oscillator. 2. Check DSP interface(IC101 ⟵ ⟶ IC501/BS) (*5).	1. Check X101 oscillator. 2. Check DSP interface(IC101 ⟵ ⟶ IC20
3	TX frequency Adjustment	Procedure	1. Set Test-mode [Continuos Send Low Power].(*3) 2. Confirm TX-carrier frequency (1CH = 906MHz).	1. Set Test-mode [Continuos Send Low P 2. Confirm TX-carrier frequency (1CH = 9
		Check point	1. Adjust frequency by VC101.(*3) 2. Check X101 oscillator Circuit.	1. Adjust frequency by VC101.(*3) 2. Check X101 oscillator Circuit.

No	Item		BS (Base unit) (*1)	HS (Handset) (*1)
4	TX Power confirmation	Procedure	1. Put RF wire to ANT and ANT_GND (See Base Unit Reference Drawing). Connect this wire Marconi or Spectrum Analyzer. 2. Set Test-mode [Continuos Send Low Power].(*3) 3. Confirm TX power level within -3-±5dBm (*2) (0.158~1.58mW) 4. Set Test-mode [Continuos Send High Power].(*3) 5. Confirm TX power level within +17±4dBm (*2) (20~126mW)	1. Put RF wire to ANT and ANT_GND (See Reference Drawing). 2. Set Test-mode [Continuos Send Low P 3. Confirm TX power level within -4±5dBr (0.126~1.26mW) 4. Set Test-mode [Continuos Send High F 5. Confirm TX power level within +16±4dE (16~100mW)
		Check point	1. Check F102 and T101 soldering. 2. Check L102~107, C101~102 and C137 soldering. 3. Check Antenna in BS.	1. Check F102 and T101 soldering. 2. Check L102~107, C101~102 and C137 s 3. Check Antenna in HS.
5	Receiver confirmation	Procedure	1. Put “HS JIG” on BS. 2. Set MODE to [NORMAL POWER] position of “HS JIG”. 3. Press [TALK] key of “HS JIG” to establish link. 4. Change MODE to [TEST POWER] position of “HS JIG“. 5. Press [TALK] key of “HS JIG” to establish link about 30cm away from “BS”.	1. Put HS on “BS JIG”. 2. Set MODE to [NORMAL POWER] positi JIG”. 3. Press [TALK] key of “HS” to establish 4. Change MODE to [TEST POWER] posit JIG”. 5. Press [TALK] key of “HS” to establish 30cm away from “BS JIG“.
		Check point	1. Check F102 and T101 soldering. 2. Check L102~107, C101~102 and C137 soldering. 3. Check Antenna in BS.	1. Check F102 and T101 soldering. 2. Check L102~107, C101~102 and C137 s 3. Check Antenna in HS.

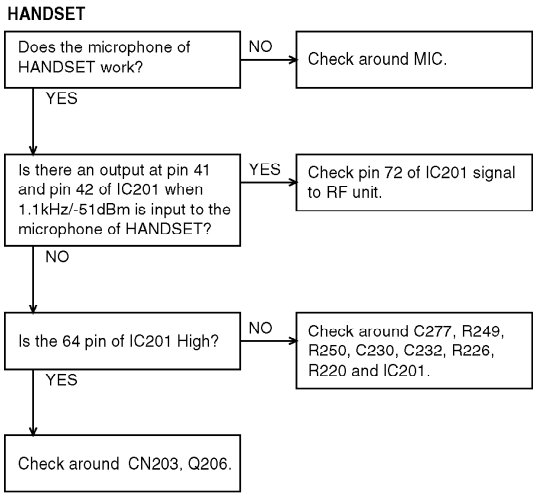
(*1)BS: Base unit, HS: Handset unit, HS JIG: Handset-jig, BS JIG: Base unit-jig
(*2)Marconi setting
TX Freq.; 906.00MHz mode; WB
Spectrum analyzer setting
Freq. 906.00MHz Span 10MHz
RBW 1MHz or above VBW same as RBW

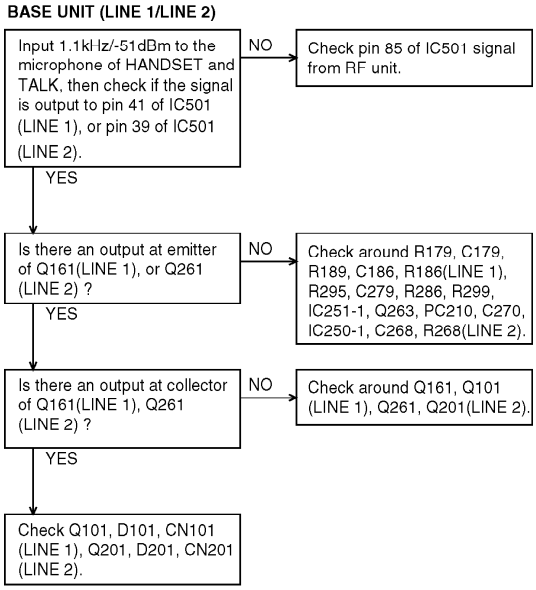
(*3)See TEST MODE AND ADJUSTMENT.
(*4)Do not adjust X101 when probe is directly attached to X101. Test probe should be attached to antenna, then adjust.
(*5)See RF-DSP interface signal wave form.

8.9.5. RF-DSP interface signal wave form



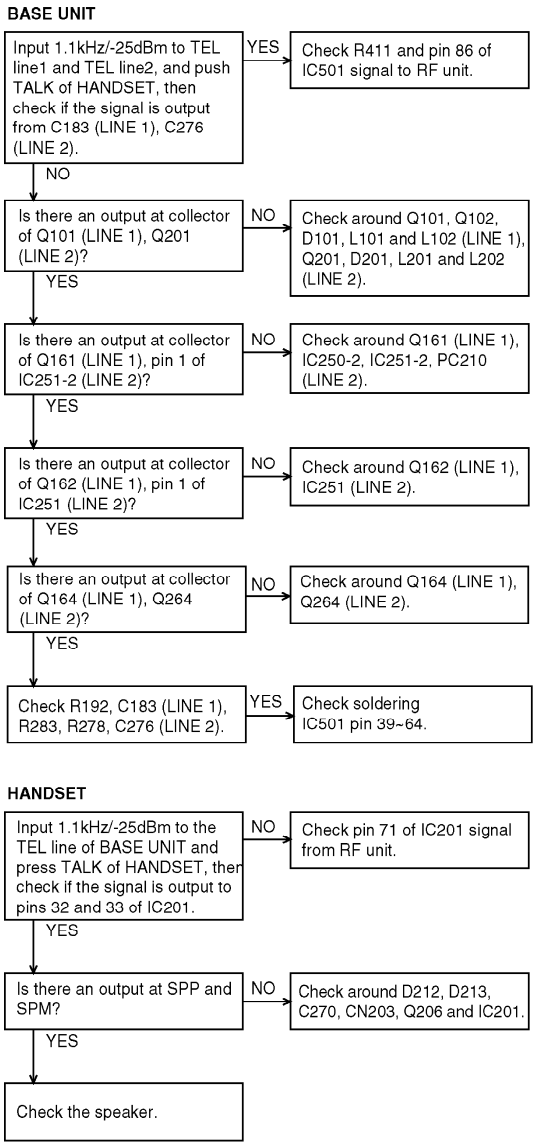
8.10. Check Handset Voice Transmission


HANDSET
Does the microphone of HANDSET work?
NO
Check around MIC.
YES
Is there an output at pin 41 and pin 42 of IC201 when 1.1kHz/-51dBm is input to the microphone of HANDSET?
YES
Check pin 72 of IC201 signal to RF unit.
NO
Is the 64 pin of IC201 High?
NO
Check around C277, R249, R250, C230, C232, R226, R220 and IC201.
YES
Check around CN203, Q206.


BASE UNIT (LINE 1/LINE 2)
Input 1.1kHz/-51dBm to the microphone of HANDSET and TALK, then check if the signal is output to pin 41 of IC501 (LINE 1), or pin 39 of IC501 (LINE 2).
NO
Check pin 85 of IC501 signal from RF unit.
YES
Is there an output at emitter of Q161(LINE 1), or Q261 (LINE 2) ?
NO
Check around R179, C179, R189, C186, R186(LINE 1), R295, C279, R286, R299, IC251-1, Q263, PC210, C270, IC250-1, C268, R268(LINE 2).
YES
Is there an output at collector of Q161(LINE 1), Q261 (LINE 2) ?
NO
Check around Q161, Q101 (LINE 1), Q261, Q201(LINE 2).
YES
Check Q101, D101, CN101 (LINE 1), Q201, D201, CN201 (LINE 2).

NOTE:
If you change MIC.
Put some bond or hot melt at hole of MIC behind after changing MIC.

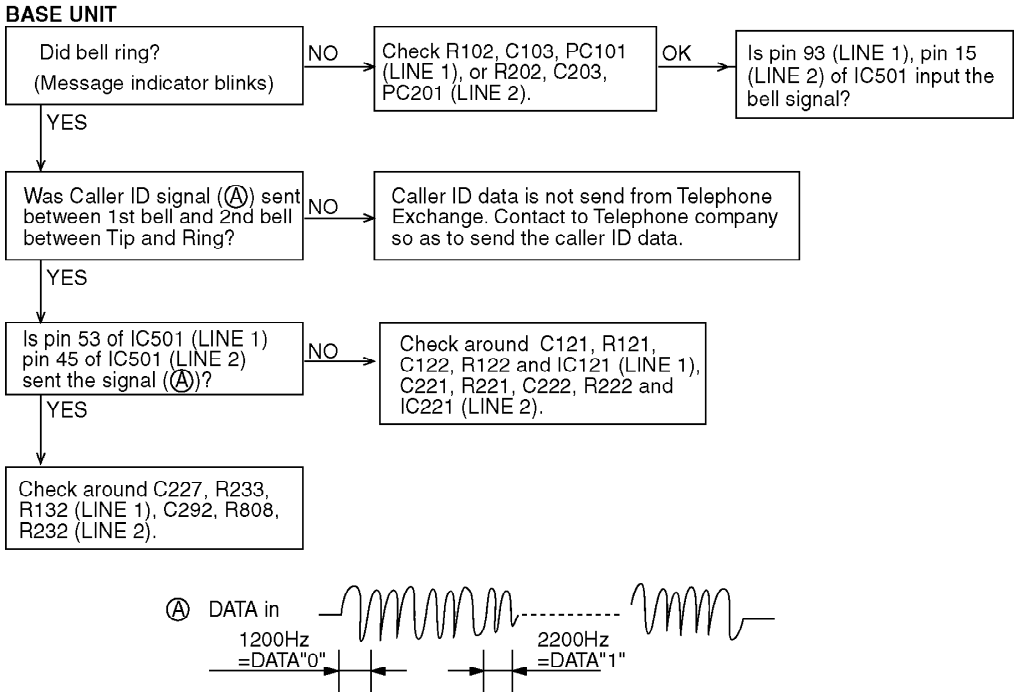
8.11. Check Handset Voice Reception


BASE UNIT
Input 1.1kHz/-25dBm to TEL line1 and TEL line2, and push TALK of HANDSET, then check if the signal is output from C183 (LINE 1), C276 (LINE 2).
YES
Check R411 and pin 86 of IC501 signal to RF unit.
NO
Is there an output at collector of Q101 (LINE 1), Q201 (LINE 2)?
NO
Check around Q101, Q102, D101, L101 and L102 (LINE 1), Q201, D201, L201 and L202 (LINE 2).
YES
Is there an output at collector of Q161 (LINE 1), pin 1 of IC251-2 (LINE 2)?
NO
Check around Q161 (LINE 1), IC250-2, IC251-2, PC210 (LINE 2).
YES
Is there an output at collector of Q162 (LINE 1), pin 1 of IC251 (LINE 2)?
NO
Check around Q162 (LINE 1), IC251 (LINE 2).
YES
Is there an output at collector of Q164 (LINE 1), Q264 (LINE 2)?
NO
Check around Q164 (LINE 1), Q264 (LINE 2).
YES
Check R192, C183 (LINE 1), R283, R278, C276 (LINE 2).
YES
Check soldering IC501 pin 39~64.
HANDSET
Input 1.1kHz/-25dBm to the TEL line of BASE UNIT and press TALK of HANDSET, then check if the signal is output to pins 32 and 33 of IC201.
NO
Check pin 71 of IC201 signal from RF unit.
YES
Is there an output at SPP and SPM?
NO
Check around D212, D213, C270, CN203, Q206 and IC201.
YES
Check the speaker.

NOTE:

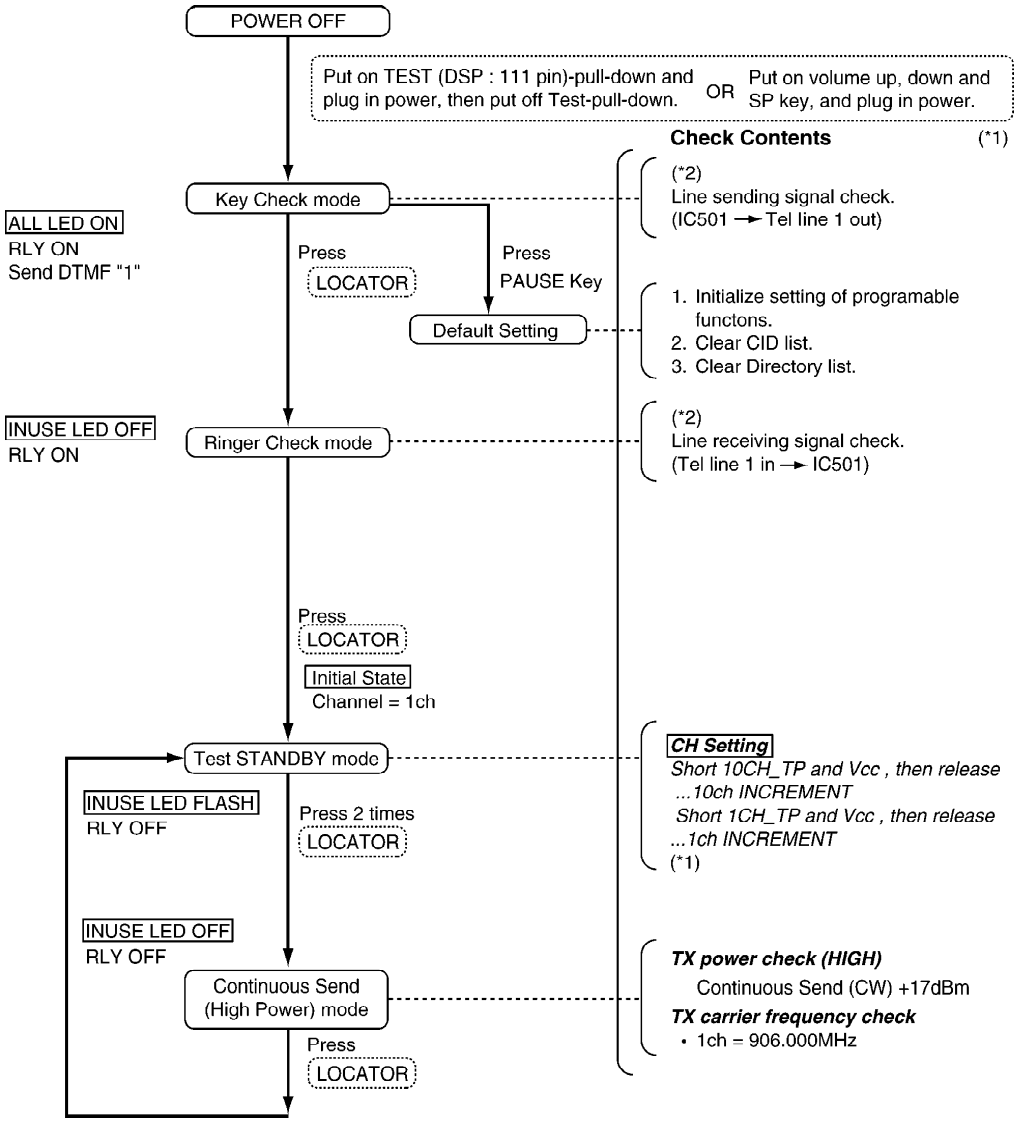
When checking the RF UNIT, Refet to Check the RF Unit.

8.12. Check Call ID


BASE UNIT
Did bell ring?
(Message indicator blinks)
NO
Check R102, C103, PC101 (LINE 1), or R202, C203, PC201 (LINE 2).
OK
Is pin 93 (LINE 1), pin 15 (LINE 2) of IC501 input the bell signal?
YES
Was Caller ID signal (Ⓐ) sent between 1st bell and 2nd bell between Tip and Ring?
NO
Caller ID data is not send from Telephone Exchange. Contact to Telephone company so as to send the caller ID data.
YES
Is pin 53 of IC501 (LINE 1) pin 45 of IC501 (LINE 2) sent the signal (Ⓐ)?
NO
Check around C121, R121, C122, R122 and IC121 (LINE 1), C221, R221, C222, R222 and IC221 (LINE 2).
YES
Check around C227, R233, R132 (LINE 1), C292, R808, R232 (LINE 2).
Ⓐ DATA in
1200Hz
=DATA"0"
2200Hz
=DATA"1"

9. TEST MODE AND ADJUSTMENT

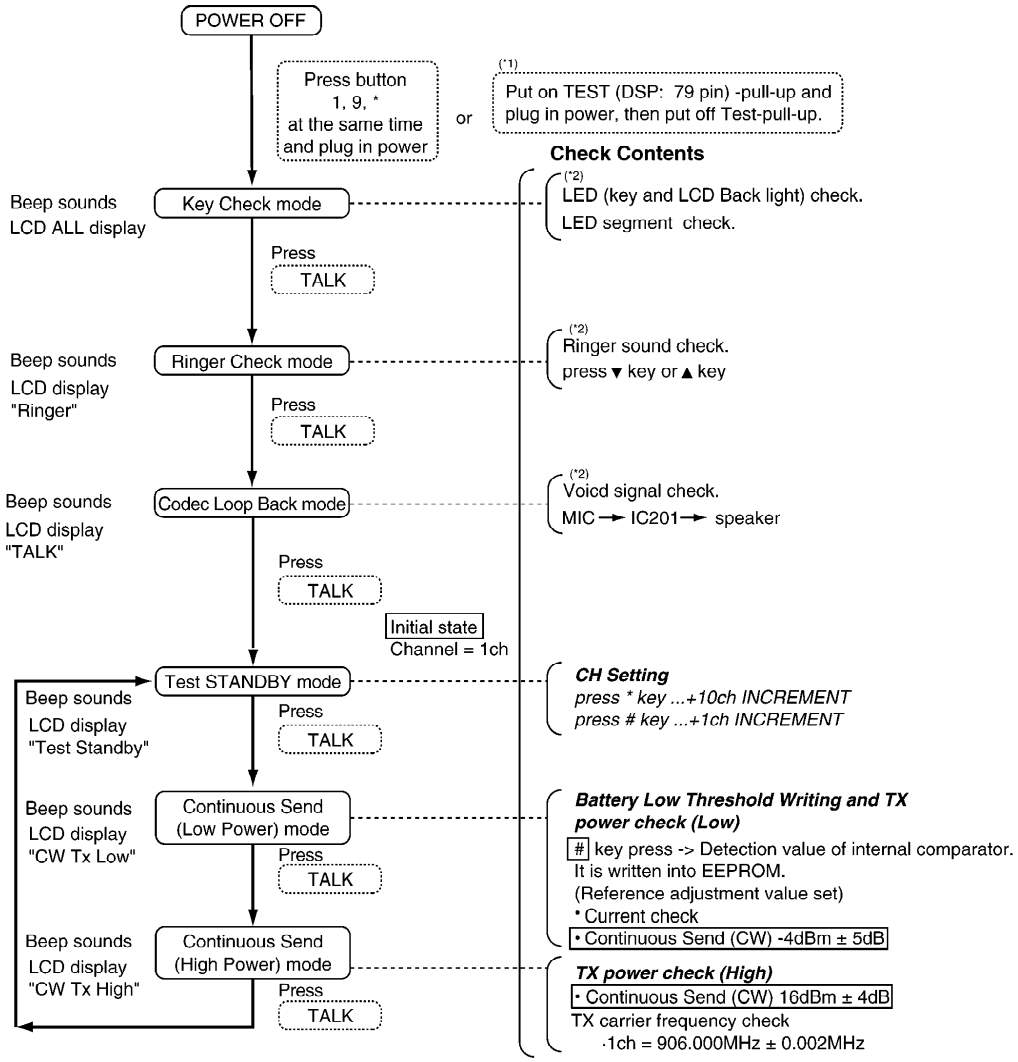
9.1. Test mode flow chart for Base Unit



(*1) See Base Unit Reference Drawing.

(*2) Special check method for Base Unit individually.

9.2. Test mode flow chart for Handset



(*1) See Handset Reference Drawing.

(*2) Special check method for Handset individually.

9.3. Adjustment X101

IN case of SS system, Carrier signal frequency directly can not be measured by Frequency counter, because sending signal is spread by PN code.

So, the confirmation and adjustment is made under the Continuous Send mode of TEST MODE.

Adjust the TX carrier(CW) frequency on the RF unit.

Equipment: Frequency counter

TP for adjustment: TP_ANT

Adjustment point: VC101 (RF unit)

Adjustment range: 906.000 ± 0.002 MHz (1ch)

9.4. Base Unit Reference Drawing

Component View

Flow Solder Side View

9.5. Handset Reference Drawing

9.6. Frequency Table

(TDD: time division duplex)

Channel	TX/RX Frequency (MHz)	Channel	TX/RX Frequency (MHz)
1	906.000	13	915.000
2	906.750	14	915.750
3	907.500	15	916.500
4	908.250	16	917.250
5	909.000	17	918.000
6	909.750	18	918.750
7	910.500	19	919.500
8	911.250	20	920.250
9	912.000	21	921.000
10	912.750	22	921.750
11	913.500	23	922.500
12	914.250	24	923.250

10. DESCRIPTION

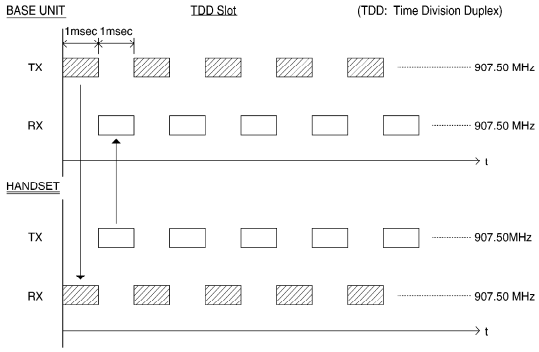
10.1. Frequency

The frequency range of 906.00 MHz ~ 923.25 MHz is used. Transmitting and receiving channel between base unit and handset is same frequency. Refer to the Frequency Table.

10.2. Time Division Duplex (TDD) operation

Transmission/reception between the base unit and handset is performed by time-sharing as shown in Fig. 7. 1 slot time of transmission and reception is 1mS.Same frequency is used in transmitting and receiving. The figure shows an example; the frequency of 3ch is used in transmitting between the base unit and handset.

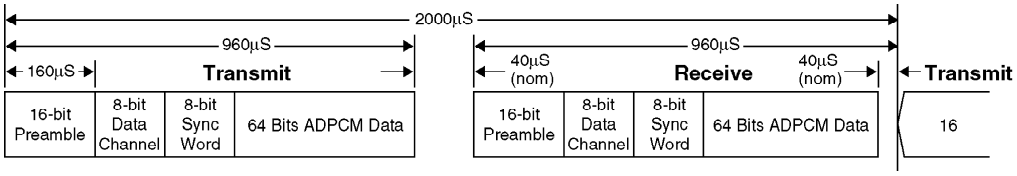
Fig. 7



10.2.1. TDD Frame Format

The TDD frame is 2mS in length, and is composed of two symmetrical 960 μ S TX and RX subframes. Each subframe contains 96 bits of 10 μ S duration, with 40 μ S guard times between both TX and RX subframes.
Each subframe consists of the following four fields:

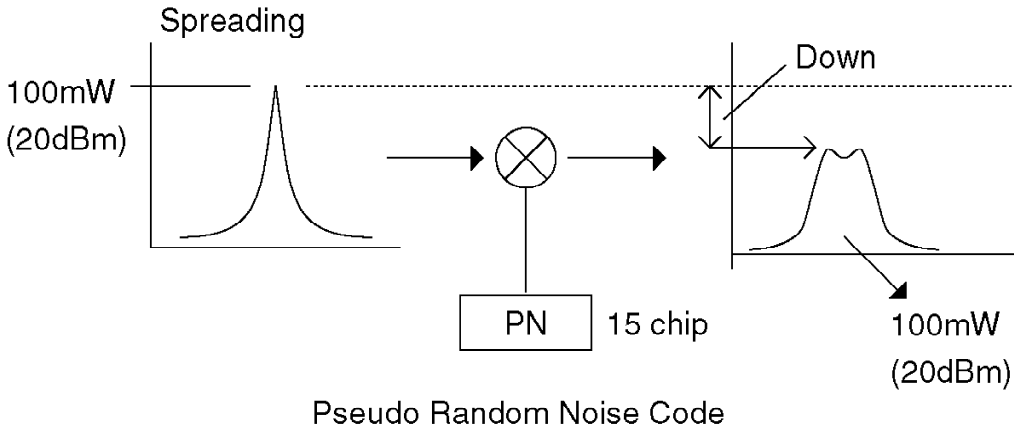
- **A 16-bit Preamble field**
- **An 8-bit Data Channel field**
- **An 8-bit Sync Word**
- **A 64-bit ADPCM Payload**



10.3. Spread Spectrum

Transmission and reception are operated using the spread spectrum method.
DSS (Digital Spread Spectrum)
Mixing the original signal with the pseudo random noise code (PN code) works the spread spectrum. In this system PN code is 15 chip. Although the band width is spread fifteen times, the power level per channel becomes lower.

Fig. 8



Pseudo Random Noise Code

10.4. Signal Flowchart in the Whole System

Reception

CN101 (LINE 1/2) or CN201 (LINE 2) of the base unit is connected to the TEL line, and the signal is input through the bridge diode D101 (LINE 1), D201 (LINE 2). While talking the relay (Q101 for LINE 1, Q201 for LINE 2) is turned ON and amplified at the amplifiers Q162 and Q164 (LINE 1), IC250, IC251, Q264 (LINE 2), then led to DSP (IC501). DSP generates ADPCM signal. The ADPCM signal is input to RFIC (IC101) of RF UNIT, and is mixed with pseudo random noise code (PN code) to spread the spectrum. RFIC outputs FSK modulated RF signal. The RF signal is passed through the balun (T101) and filter (F102) to be transmitted from the antenna. As for the handset, RF signal from the antenna is input to RFIC passing through filter (F102) and the balun (T101) to perform the de-spread, then input to DSP (IC201). DSP performs ADPCM decoding to convert the signal into the voice signal, then it is output to the speaker.

Transmission

The voice signal input from the microphone is led to DSP (IC201). The DSP generates ADPCM signal. As well as the reception, it is converted into the RF signal by RFIC (IC101). Passing through the balun (T101) and filter (F102), it is transmitted from the antenna. As for the base unit, RF signal from the antenna is input to RFIC (IC101) passing through filter (F102) and the balum (T101) to perform the de-spread, then input to DSP (IC501). DSP performs ADPCM decoding to convert the signal into the voice signal. The voice signal is amplified at the TX amplifier (Q161 for LINE 1, Q261 for LINE 2), then output to the TEL line CN101 (LINE 1), CN201 (LINE 2) through the relay (Q101 for LINE 1, Q201 for LINE 2) and bridge (D101 for LINE 1, D201 for LINE 2).

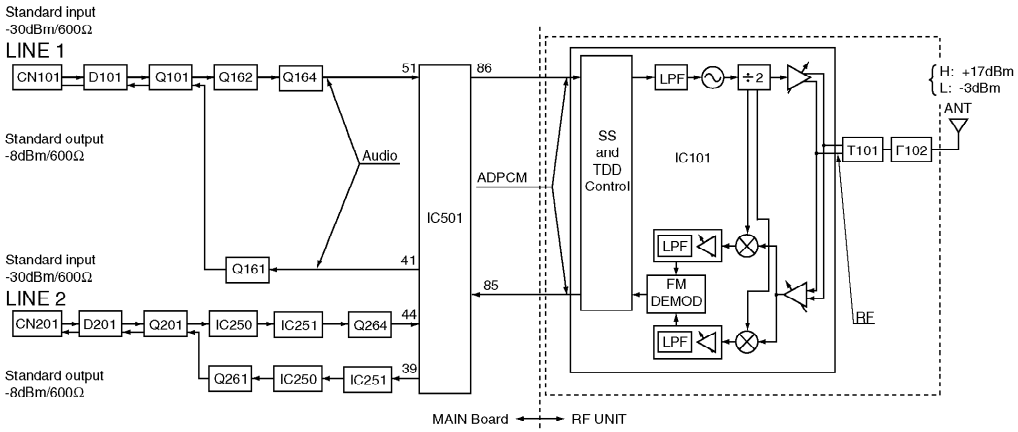


Fig. 9-1 BASE UNIT

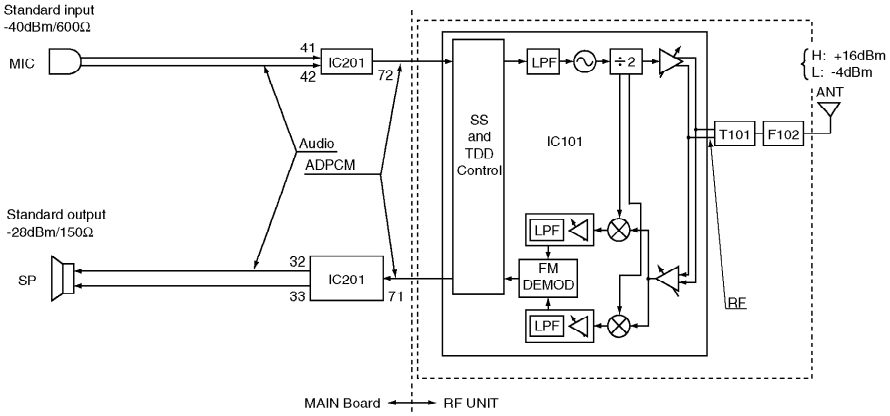
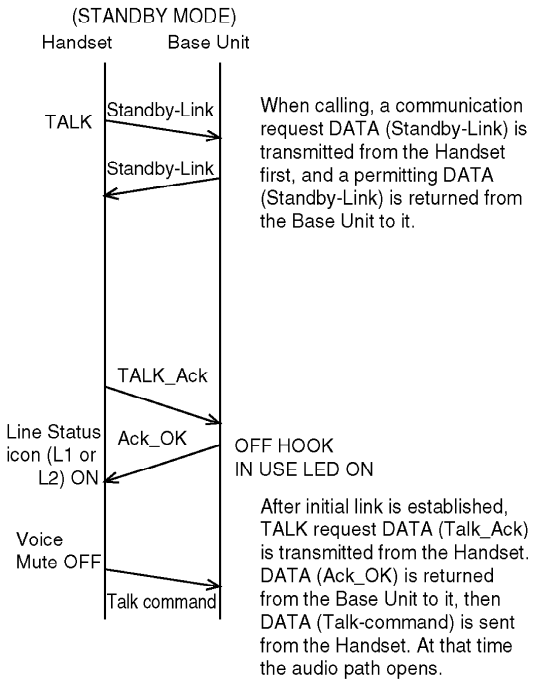


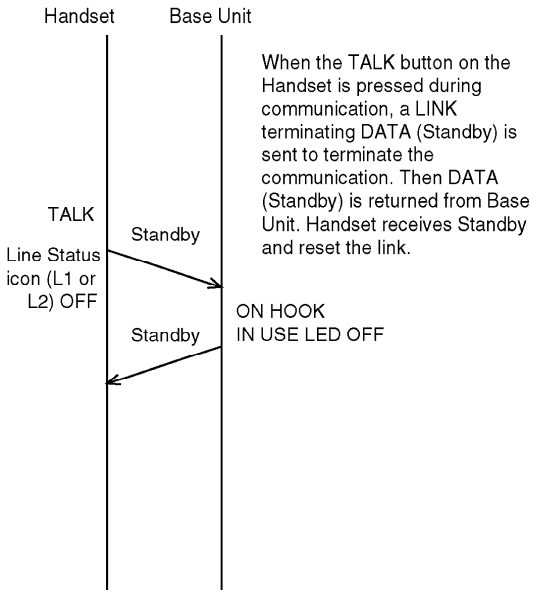
Fig. 9-2 HANDSET

10.5. EXPLANATION OF BBIC DATA COMMUNICATION

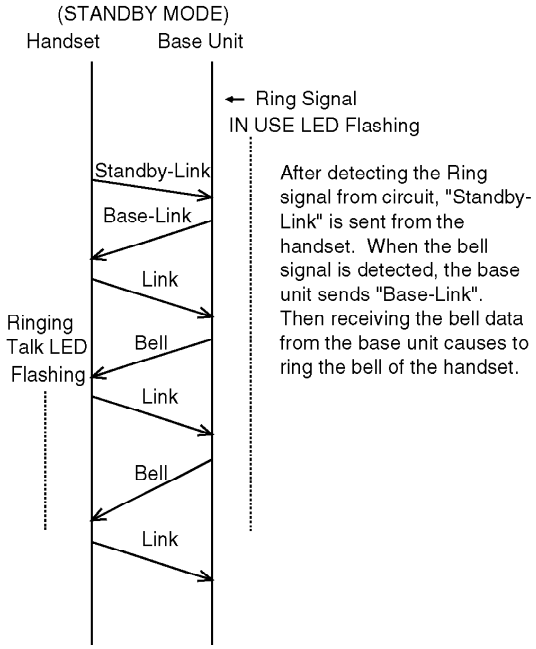
10.5.1. Calling


(STANDBY MODE)
Handset
Base Unit
TALK
Standby-Link
Standby-Link
When calling, a communication request DATA (Standby-Link) is transmitted from the Handset first, and a permitting DATA (Standby-Link) is returned from the Base Unit to it.
TALK_Ack
Line Status icon (L1 or L2) ON
Ack_OK
OFF HOOK
IN USE LED ON
After initial link is established, TALK request DATA (Talk_Ack) is transmitted from the Handset. DATA (Ack_OK) is returned from the Base Unit to it, then DATA (Talk-command) is sent from the Handset. At that time the audio path opens.
Voice Mute OFF
Talk command

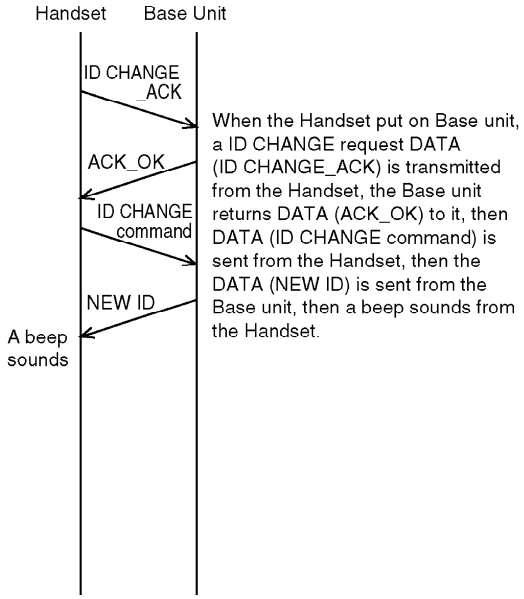
10.5.2. To Terminate Communication


Handset
Base Unit
When the TALK button on the Handset is pressed during communication, a LINK terminating DATA (Standby) is sent to terminate the communication. Then DATA (Standby) is returned from Base Unit. Handset receives Standby and reset the link.
TALK
Line Status icon (L1 or L2) OFF
Standby
ON HOOK
IN USE LED OFF
Standby

10.5.3. Ringing



10.5.4. ID Change


Handset
Base Unit
ID CHANGE ACK
ACK_OK
ID CHANGE command
NEW ID
A beep sounds
When the Handset put on Base unit, a ID CHANGE request DATA (ID CHANGE_ACK) is transmitted from the Handset, the Base unit returns DATA (ACK_OK) to it, then DATA (ID CHANGE command) is sent from the Handset, then the DATA (NEW ID) is sent from the Base unit, then a beep sounds from the Handset.

11. TERMINAL GUIDE OF IC'S, TRANSISTORS AND DIODES

11.1. Base Unit

<table>
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PQVDRLZ5R1
PQVDRLZ8R2
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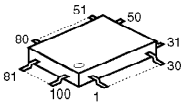
<td> 
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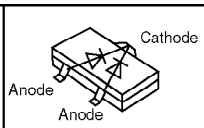
<td> 
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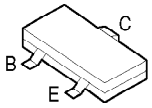
<td> 
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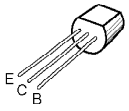
<td> 
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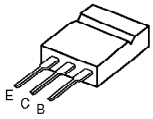
<td> 
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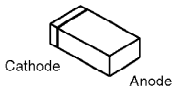
<td colspan="2"> 
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MA8047, MA111 MA8051,
MA8036H, MA8039</td>
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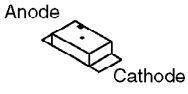
<td> 
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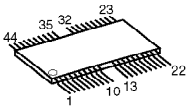
<td> 
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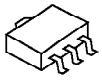
<td> 
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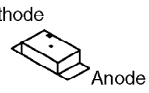
<td> 
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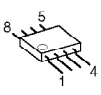
<td> 
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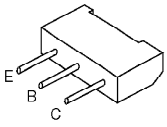
<td> 
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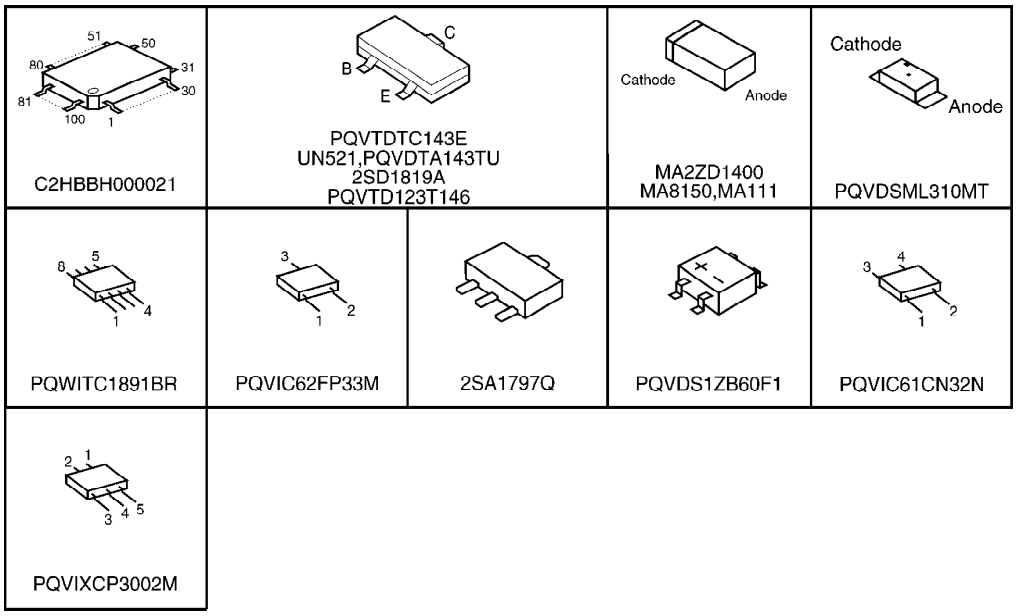
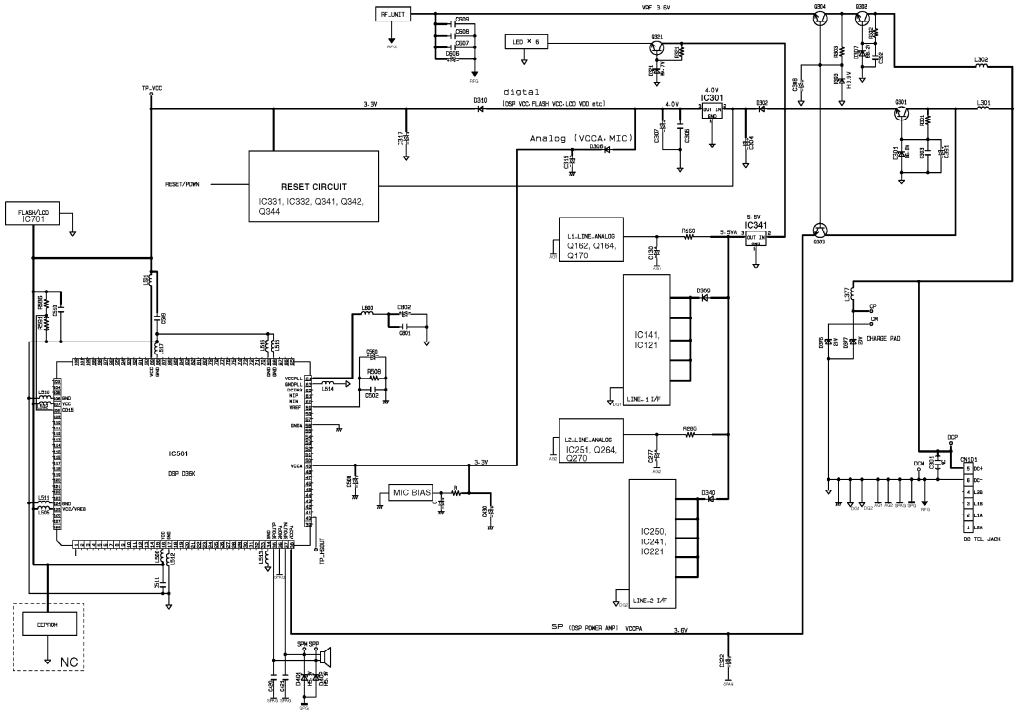
11.2. Handset

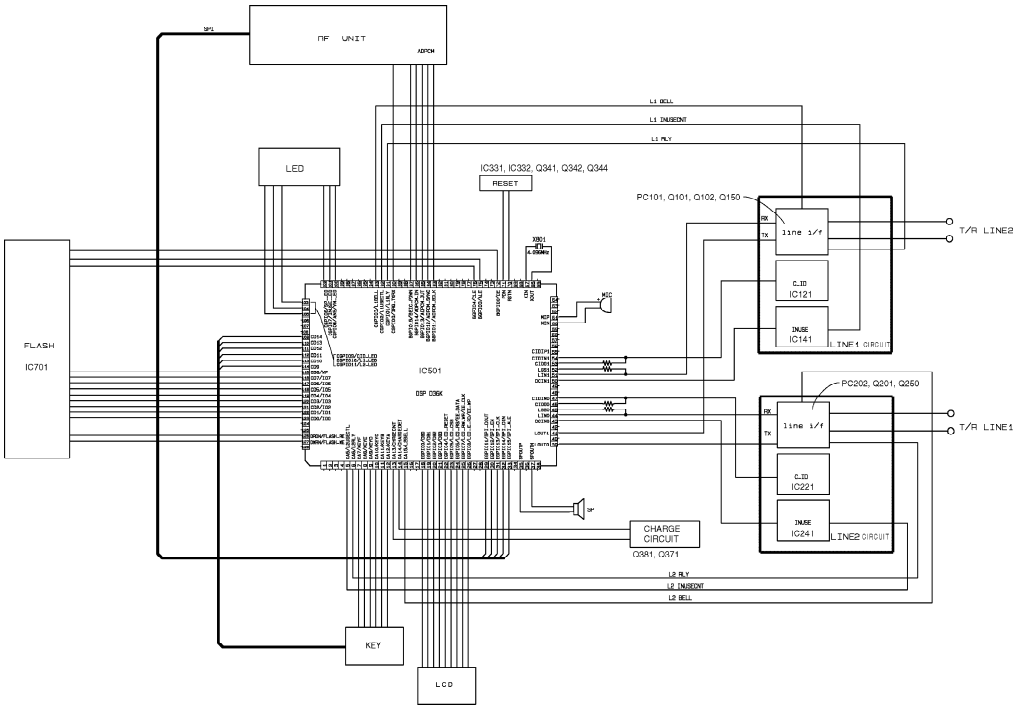


12. BLOCK DIAGRAM (Base Unit)

12.1. Power Supply



12.2. DSP Control



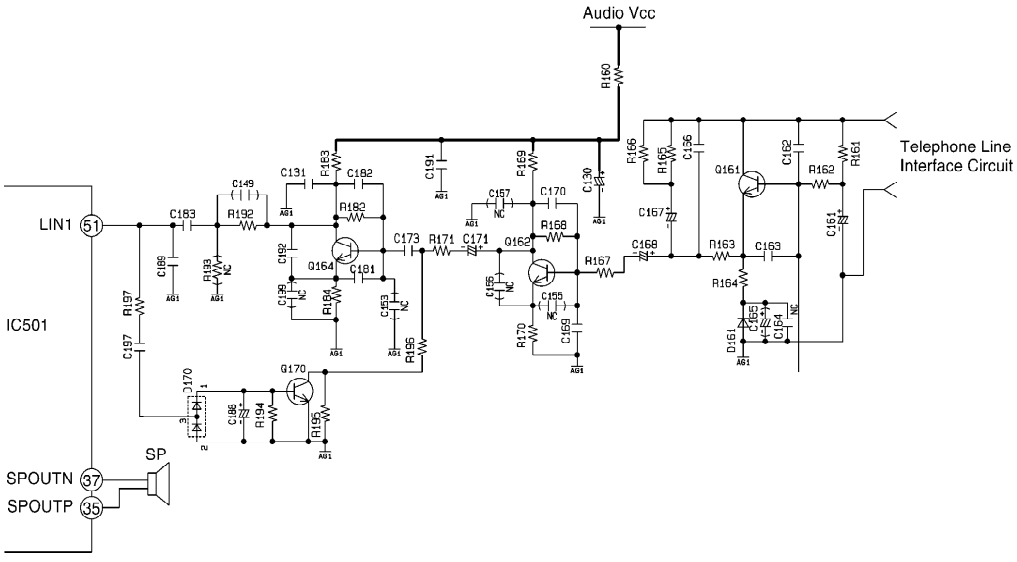
13. CIRCUIT OPERATION (Base Unit)

13.1. SP-PHONE RX Circuit

13.1.1. LINE 1

Circuit Operation:

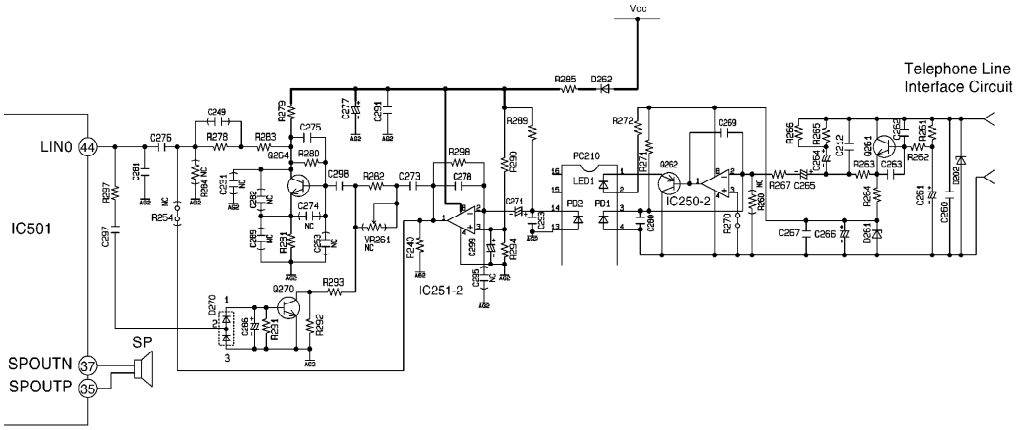
Telephone Line Interface → Q161 → C168 → R167 → Q162 → C171 → R171 → C173 → Q164 → R192 → C183 → pin 51 of IC501 → pins 35 and 37 of IC501 → Speaker



13.1.2. LINE 2

Circuit Operation:

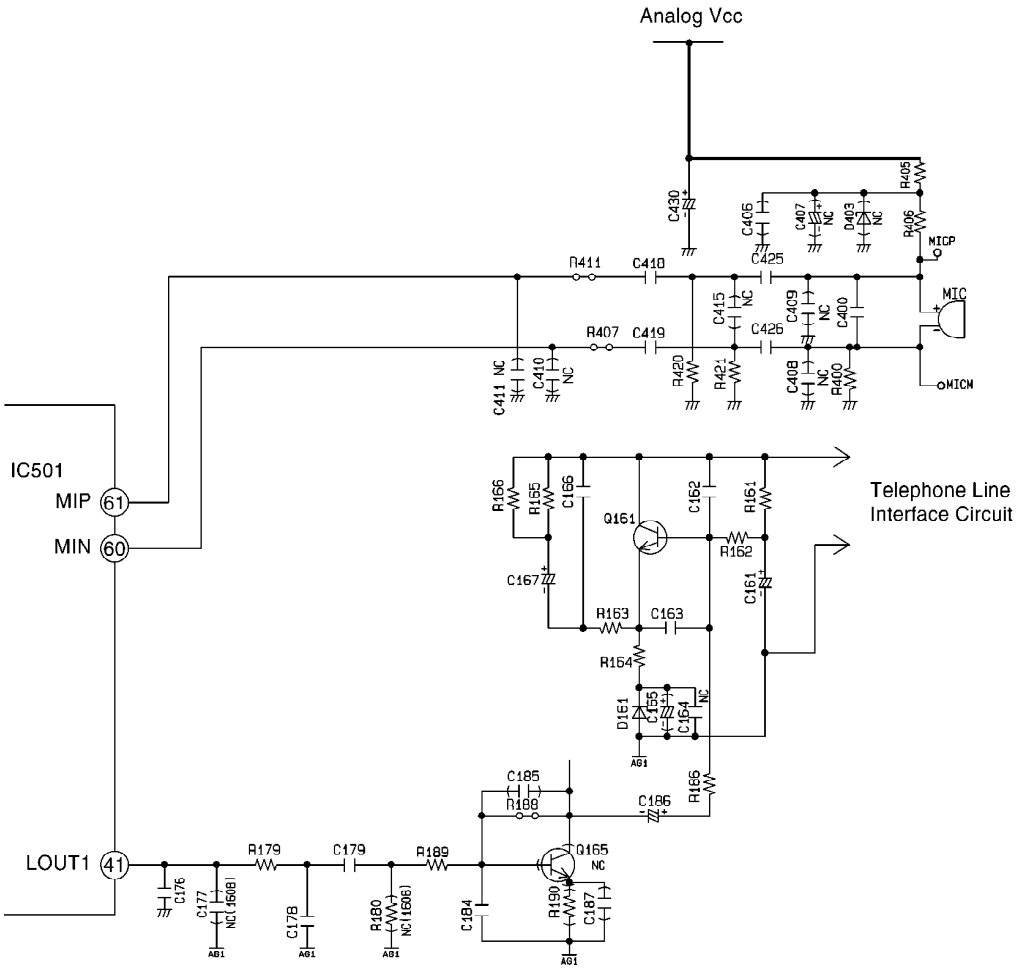
Telephone Line Interface → Q261 → R263 → C265 → R267 → IC250-2 → Q262 → PC210 → C271 → IC251-2 → C273 → R282 → C298 → Q264 → C276 → pin 44 of IC501 → pins 35 and 37 of IC501 → Speaker



13.2. SP-PHONE TX Circuit

13.2.1. LINE 1

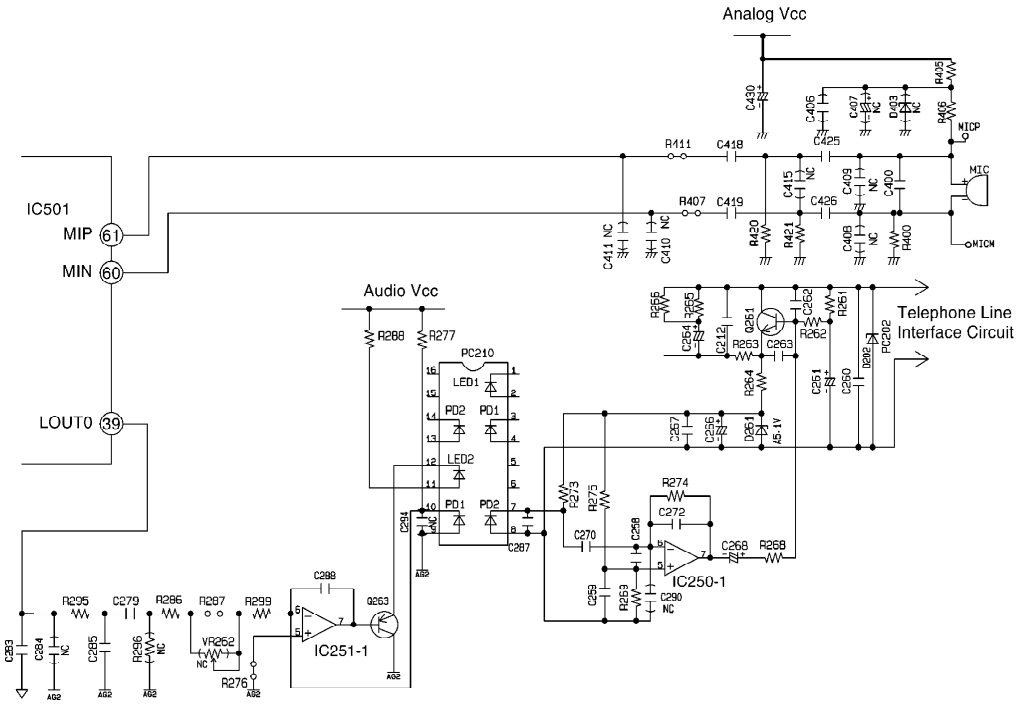
Circuit Operation:
MIC → C425, C426 → C418, C419 → pins 60 and 61 of IC501 → pin 41 of IC501 → R179 → C179 → R189 → R188 → C186 → R186 → Q161 → Telephone Line Interface Circuit



13.2.2. LINE 2

Circuit Operation:

MIC → C425, C426 → C418, C419 → pins 60 and 61 of IC501 → pin 39 of IC501 → R295 → C279 → R286 → R287 → R299 → IC251-1 → Q263 → PC210 → C270 → IC250-1 → C268 → R268 → Q261 → Telephone Line



13.3. Power Supply Circuit

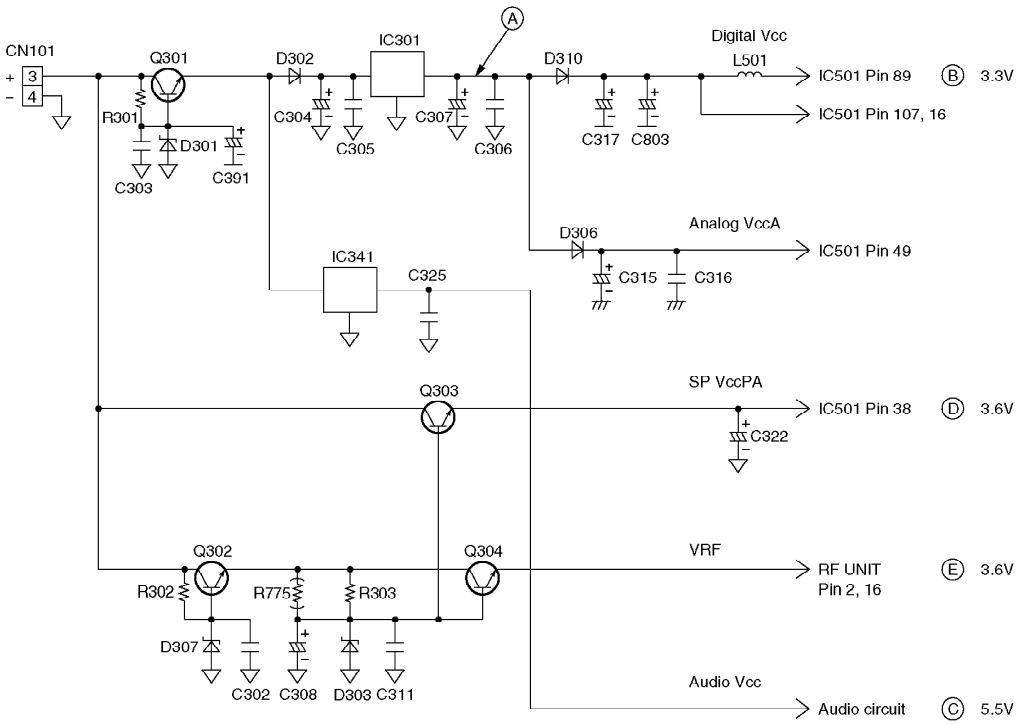
Function:

Power from the AC adaptor passes through a regulating block consisting of IC301.

Circuit Operation:

IC301 is a regulated power supply. The voltage at point A is regulated to 4.0V by IC301.
The voltage at point B is dropped by D306 and D310 to 3.3V.
The voltage at point C is regulated to 5.5V by IC341.
The voltage at point D is dropped by Q303 to 3.6V.
The voltage at point E is dropped by Q302, Q304 to 3.6V.

Circuit Diagram



13.4. DTMF Signal

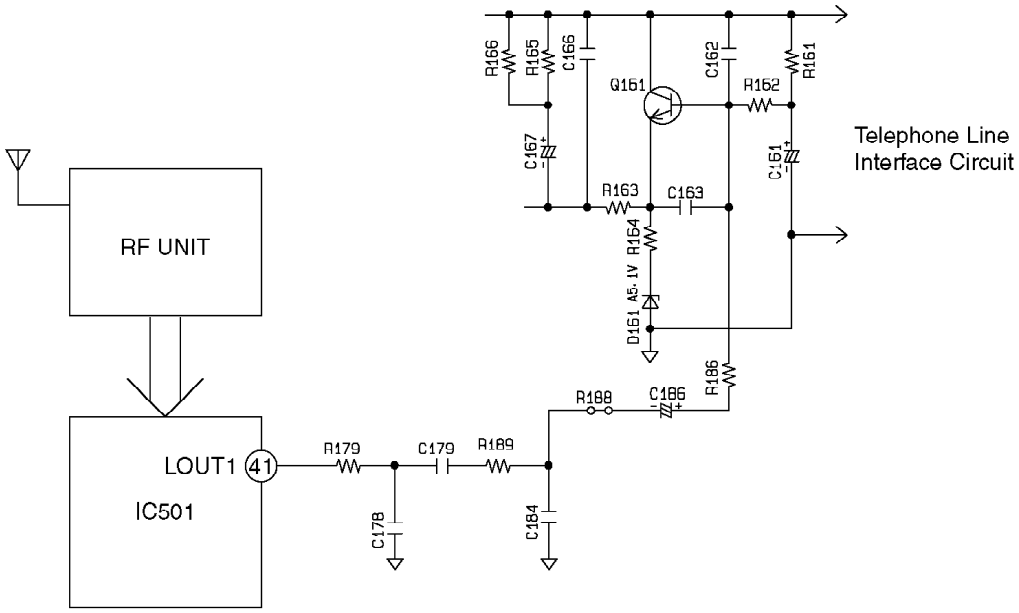
When the DTMF data from the Handset is received, the DTMF signal is output from pin 41 (LINE 1), pin 39 (LINE 2) of IC501 and sent to the line through Q161 (LINE 1), Q261 (LINE 2).

13.5. LINE Sending Signal

13.5.1. LINE 1

The modulation signal input from the RF unit is demodulated by IC501.
IC501 generates the ADPCM signal (Digital) corresponded to Audio signal, and this ADPCM signal is input to RF unit.

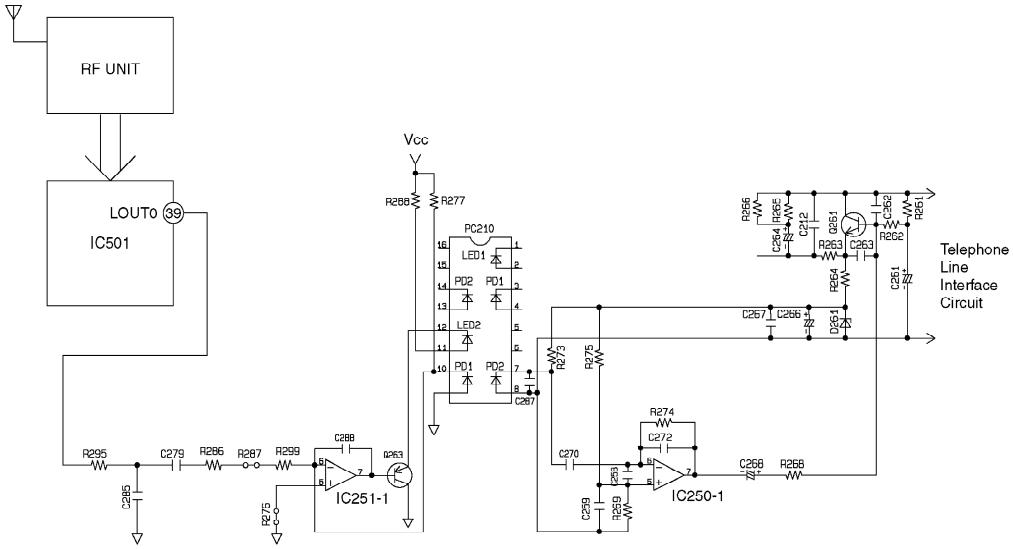
Circuit Operation:
pin 41 of IC501 → R179 → C179 → R189 → R188 → C186 → R186 → Telephone Line



13.5.2. LINE 2

The modulation signal input from the RF unit is demodulated by IC501.
The audio signal output from pin 39 of IC501and is input to telephone Line.

Circuit Operation:
pin 39 of IC501 → R295 → C279 → R286 → R287 → pin 7 of IC251 → Q263 → pin 12 of PC210 → pin 7 of PC210 → C270 → pin 7 of IC250 → C268 → R268 → Telephone Line

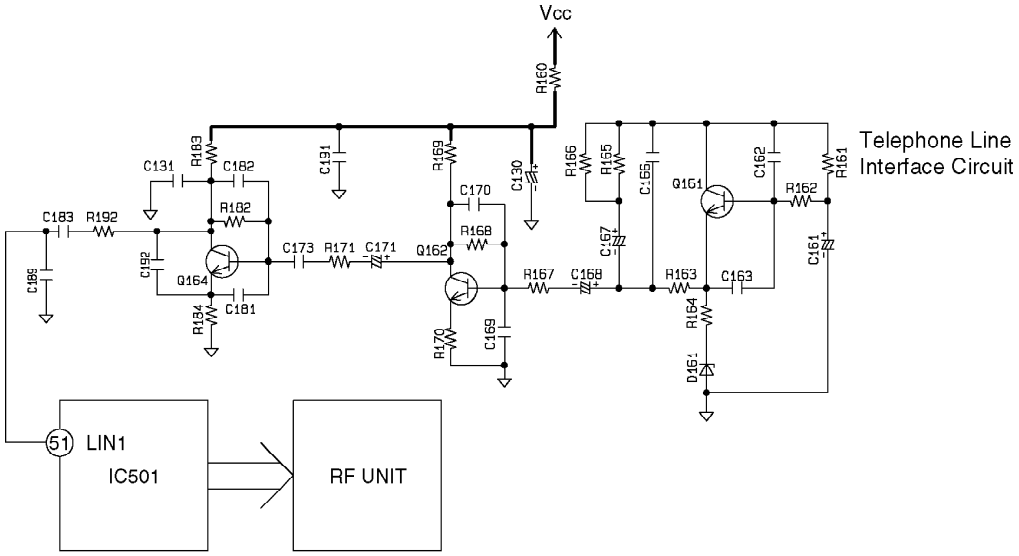


13.6. Line Receiving Signal

13.6.1. LINE 1

The audio signal from line passes through Q162 and Q164, and the signal is input to pin 51 of IC501.
IC501 modulates the input audio signal to output to the RF unit.

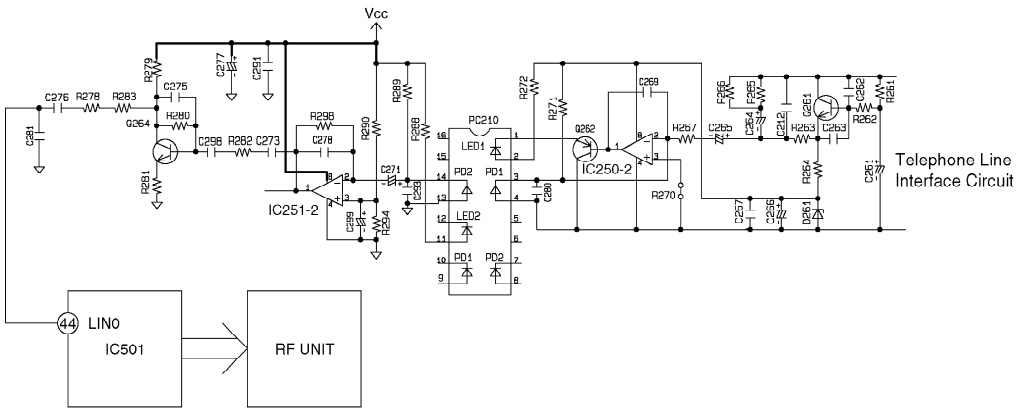
Circuit Operation:
Telephone Line (T/R) → Q161 → C168 → R167 → Q162 → C171 → R171 → C173 → Q164 → R192 → C183 → pin 51 of IC501 → RF UNIT



13.6.2. LINE 2

The audio signal from line passes through IC250, Q262, PC210, IC251 and Q264, and the signal is input to pin 44 of IC501.
IC501 modulates the input audio signal to output to the RF unit.

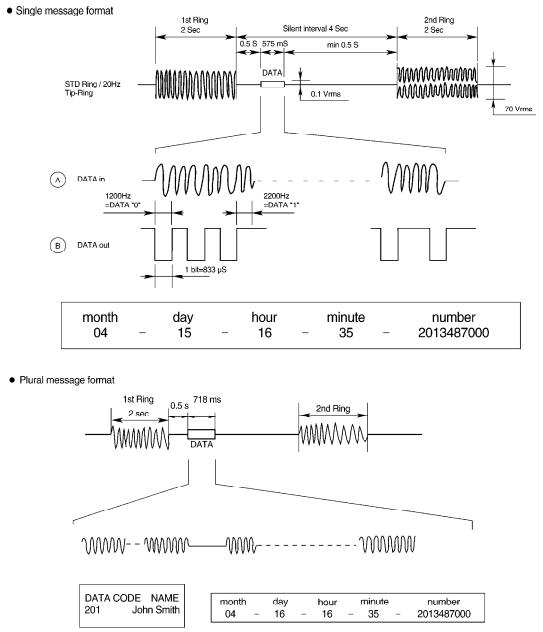
Circuit Operation:
Telephone Line (T/R) → Q261 → C265 → R267 → pin 1 of IC250 → Q262 → pin 1 of PC210 → pin 14 of PC210 → C271 → pin 1 of IC251 → C273 → R282 → C298 → Q264 → R283 → R278 → C276 → pin 44 of IC501 → RF UNIT



13.7. Calling Line Identification Circuit (Caller ID)

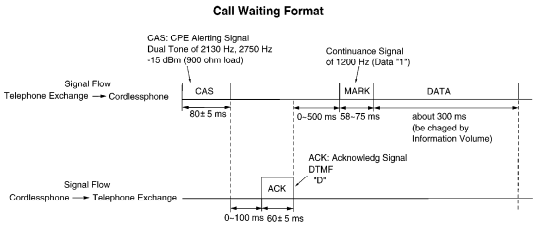
Function:
The caller ID is a chargeable ID which the user of a telephone circuit obtains by entering a contract with the telephone company to utilize a caller ID service. For this reason, the operation

of this circuit assumes that a caller ID service contract has been entered for the circuit being used.
The data for the caller ID from the telephone exchange is sent during the interval between the first and second rings of the bell signal. The data from the telephone exchange is a modem signal which is modulated in an FSK (Frequency Shift Keying) format. Data "0" is a 1200 Hz sine wave, and data 1 a 2200 Hz sine wave.
There are two type of the message format which can be received: i.e. the single message format and plural message format. The plural message format allows to transmit the name and data code information in addition to the time and telephone number data.

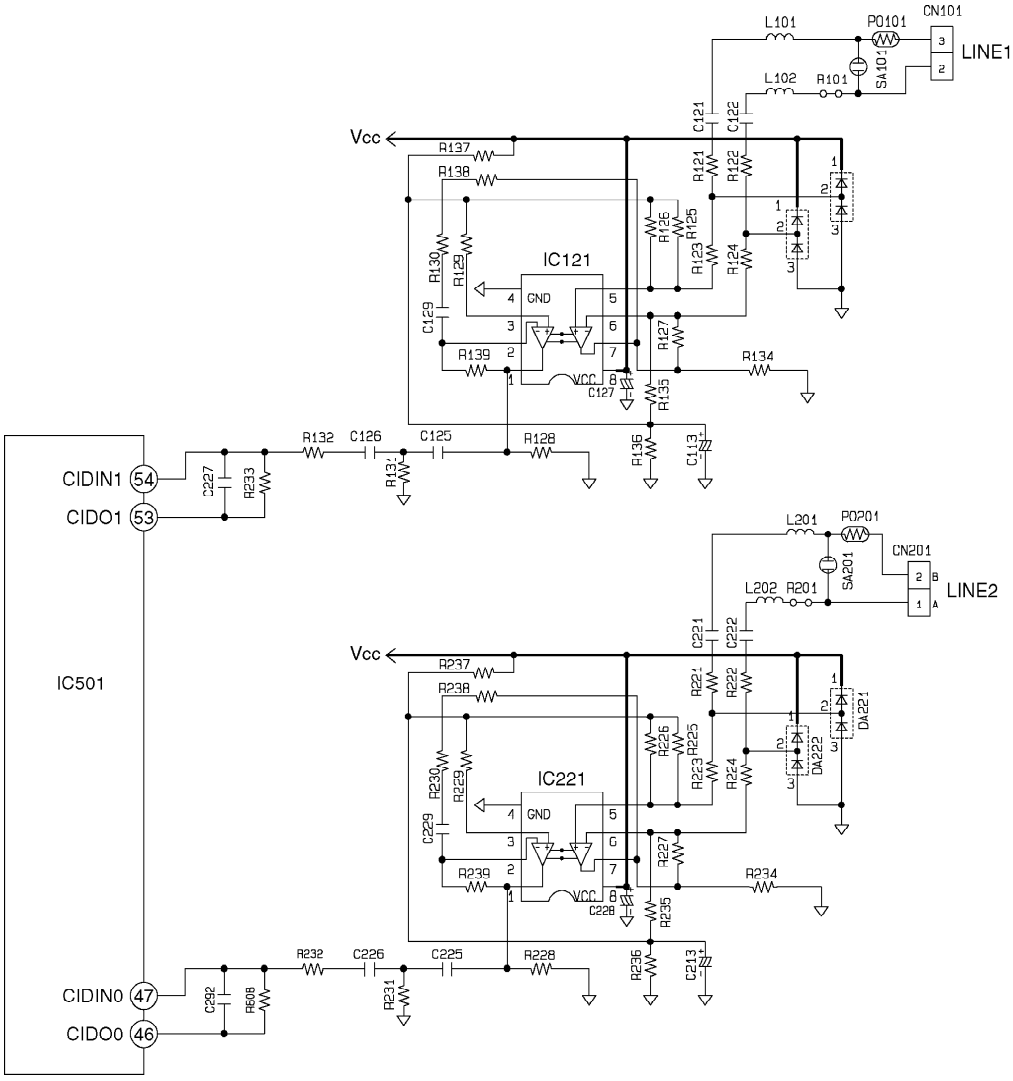


Call Waiting
Calling Identity Delivery on Call Waiting (CIDCW) is a CLASS service that allows a customer, while off-hook on an existing call, to receive information about a calling party on a waited call. The transmission of the calling information takes place almost immediately after the customer is alerted to the new call so he/she can use this information to decide whether to take the new call.

Function:
The CAS signal flows from [T/R → C121, C122 → R121, R122 → IC121 → IC501 pins 54 (LINE1)], [T/R → C221, C222 → R221, R222 → IC221 → IC501 pins 47 (LINE2)] and the ACK (DTMF signal) is returned to the telephone exchange. The telephone exchange that received the ACK can send the data in the same manner as the caller ID. If the unit deems that a telephone connected in parallel is in use, ACK is not returned even if CAS is received, and the information for the second and subsequent callers is not displayed on the portable handset display.



13.7.1. Circuit Diagram



13.8. Parallel Connection Detection Circuit

Function:

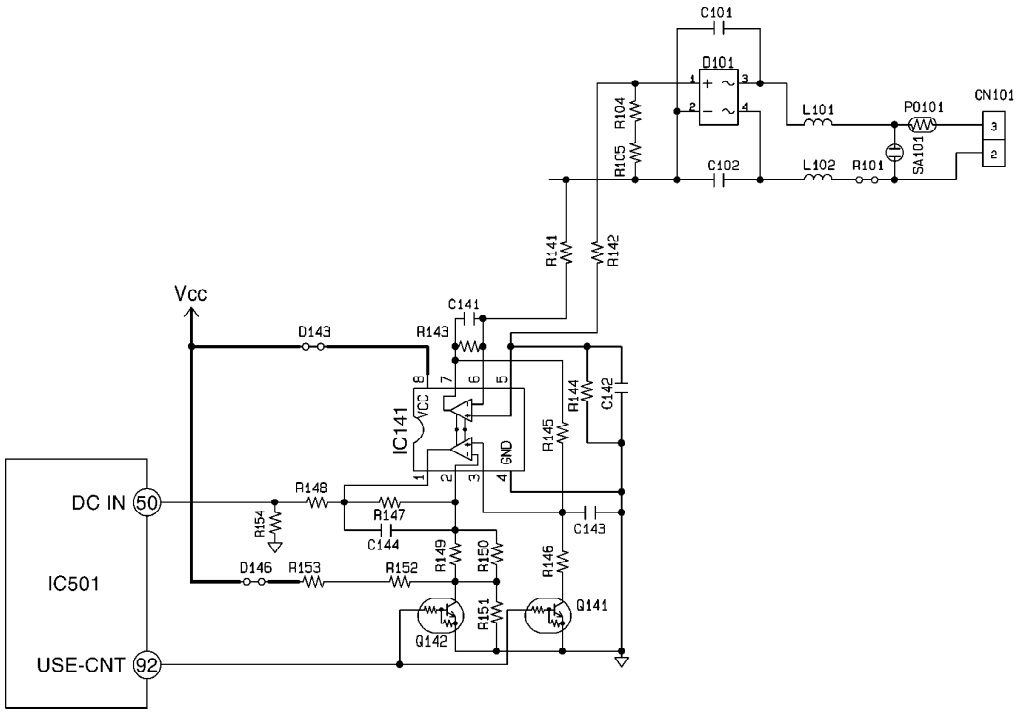
In order to disable call waiting and stutter tone functions when using telephones connected in parallel, it is necessary to have a circuit that judges whether a telephone connected in parallel is in use or not. This circuit determines whether the telephone connected in parallel is on hook or off hook by detecting changes in the T/R voltage.

Circuit Operation:

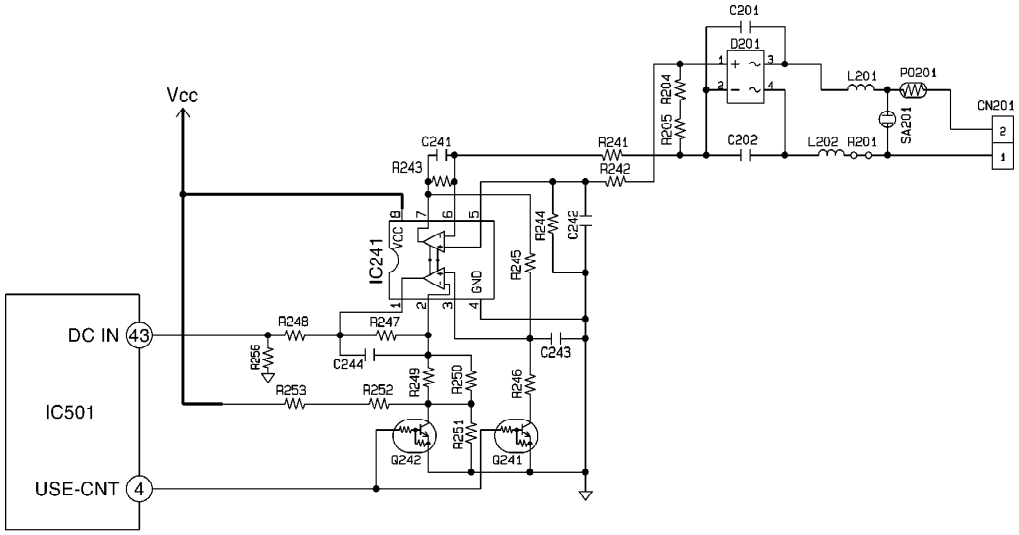
Parallel connection detection when on hook:
When on hook Q141, Q142 (LINE 1), Q241, Q242 (LINE 2) is ON, the voltage is monitored pin 50 (LINE 1) and 43 (LINE 2) of IC501. There is no parallel connection if the voltage is 1.65 V or higher, while a parallel connection is deemed to exist if the voltage is lower.

Parallel connection detection when off hook:
When off hook Q141, Q142 (LINE 1), Q241, Q242 (LINE 2) is OFF, the voltage is monitored pin 50 (LINE 1) and 43 (LINE 2) of IC501; the presence/absence of a parallel connection is determined when the voltage changes by 0.2 V or more.

13.8.1. LINE 1



13.8.2. LINE 2

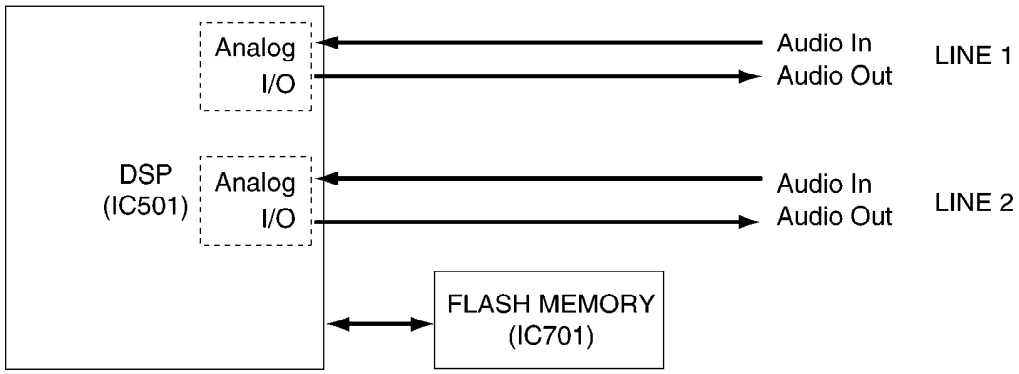


13.9. DSP (Digital Speech/Signal Processing) Circuit

General Description:
(IC501, IC701) is a digital speakerphone/speech/signal processing system that implements all the functions of speech compression, record and playback, and memory management required in a digital telephone answering machine.
The DSP system is fully controlled by a host processor IC501. The host processor provides activation and control of all that functions, such as speech Recording, Playback, Tone detecting and Line monitoring.

The DSP system comprises of following.
— a Host Processor.
— a Digital Signal Processor which includes the firmware implemented functions.
— a FLASH MEMORY (IC701), which is used for stored voice messages and synthesized voice.

Circuit Diagram



- Voice Message Recording

The DSP system use a proprietary speech compression technique to record and store voice message in FLASH MEMORY (IC701).

An error correction algorithm is used to enable playback of these messages from the FLASH MEMORY (IC701).

- DTMF Detection

The DTMF detection is implemented by the DSP system in software. The DTMF detection is performed during Record, Playback, and Line Monitoring modes of operation.

- Synthesized Voice

The DSP implements synthesized Voice, utilizing the built in speech detector and an FLASH MEMORY (IC701), which stored the vocabulary.

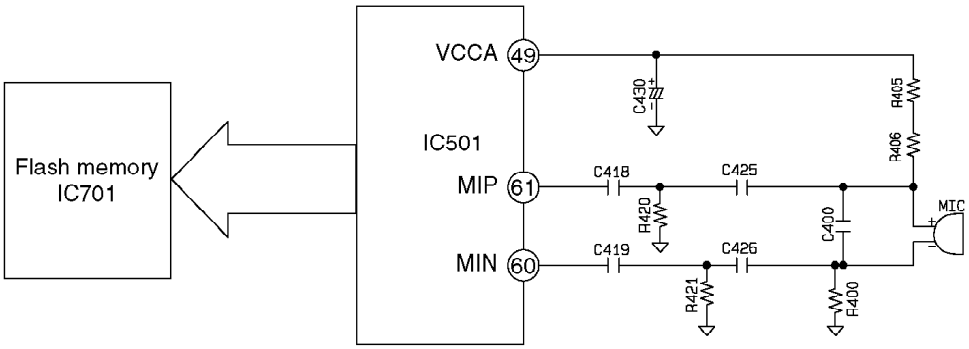
- Caller ID and Call Waiting CID demodulation

The DSP implements monitor and demodulate the FSK signals that provide CID information from the Central Office.

13.10. Greeting Recording Circuit

Circuit Operation:

MIC+ → C425 → C418 → pin 61 of IC501
MIC– → C426 → C419 → pin 60 of IC501 → IC701

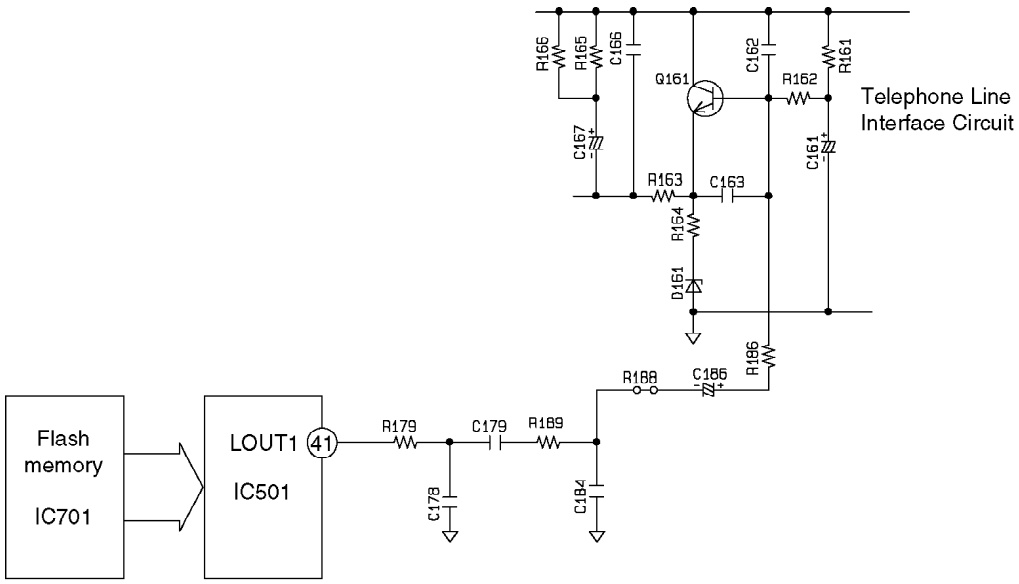


13.11. Greeting Play Back Circuit

13.11.1. LINE 1

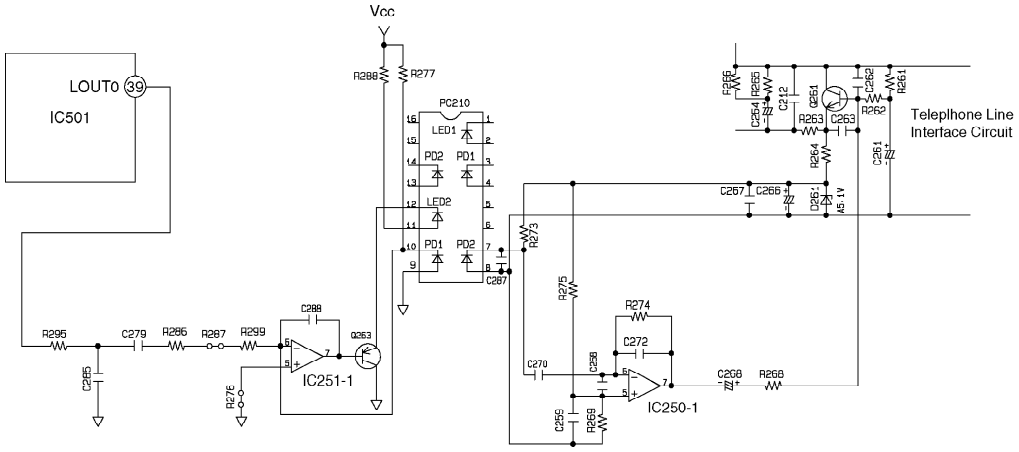
Circuit Operation:

IC701 → pin 41 of IC501 → R179 → C179 → R189 → C186 → R188 → C186 → R186 → Telephone Line.



13.11.2. LINE 2

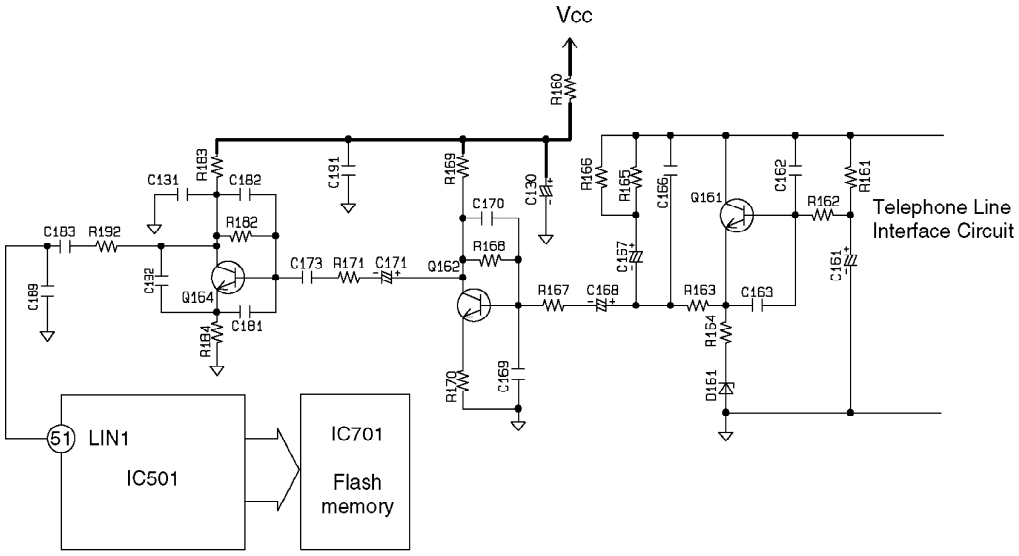
Circuit Operation:
pin 39 of IC501 → R295 → C279 → R286 → R287 → R299 → pin 7 of IC251 → Q263 → pin 12 of PC210 → pin 7 of PC210 → C270 → pin 7of IC250 → C268 → R268 → Telephone Line.



13.12. ICM Recording Circuit

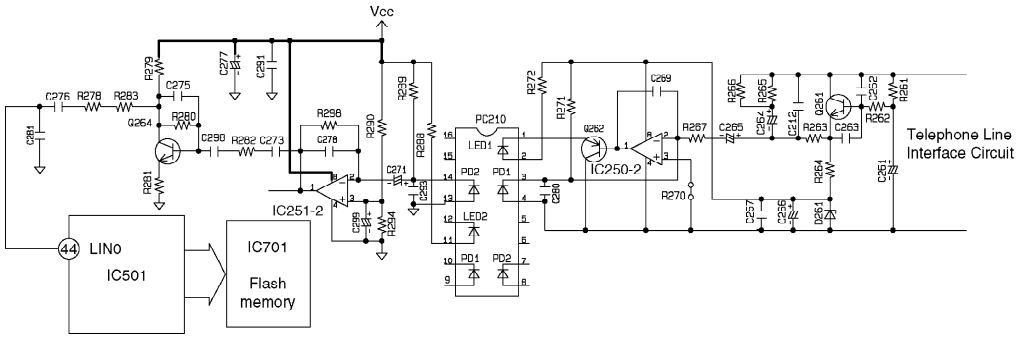
13.12.1. LINE 1

Circuit Operation:
Telephone Line (T/R) → Q161 → C168 → R167 → Q162 → C171 → R171 → C173 → Q164 → R192 → C183 → pin 51 of IC501 → IC701



13.12.2. LINE 2

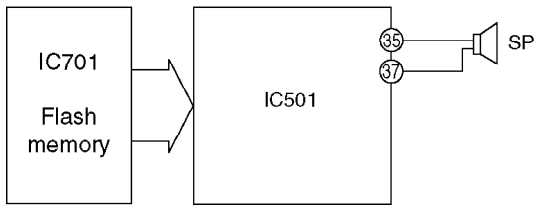
Circuit Operation:
Telephone Line (T/R) → Q261 → C265 → R267 → pin 1 of IC250 → Q262 → pin 1 of PC210 → pin 14 of PC210 → C271 → pin 1 of IC251 → C273 → R282 → C298 → Q264 → R283 → R278 → C276 → pin 44 of IC501 → IC701



13.13. ICM Play Circuit

Circuit Operation:
IC701 → pins 35 and 37 of IC501 → Speaker.

Circuit Diagram



13.14. Telephone Line Interface

13.14.1. LINE 1

Circuit Operation:

ANSWER

In the idle mode, Q101 is open to cut the DC loop current and decrease the ring load. When ring voltage appears at the Tip (T) and Ring (R) leads (When the telephone rings), the AC ring voltage is transferred as follows:

T → L101 → C103 → PC101 → IC501 pin 93.

When the CPU (DSP) detects a ring signal, Q101 turns on, thus providing an off-hook condition (active DC current flow through the circuit) and the following signal flow is for the voice signal.

T → PO101 → D101 → Q101 → Q161 → Q102 → D101 → L102 → R

ON HOOK

Q101 is open, Q101 is connected as to cut the DC loop current and to cut the voice signal. The unit is consequently in an on-hook condition.

SPECIFICATIONS

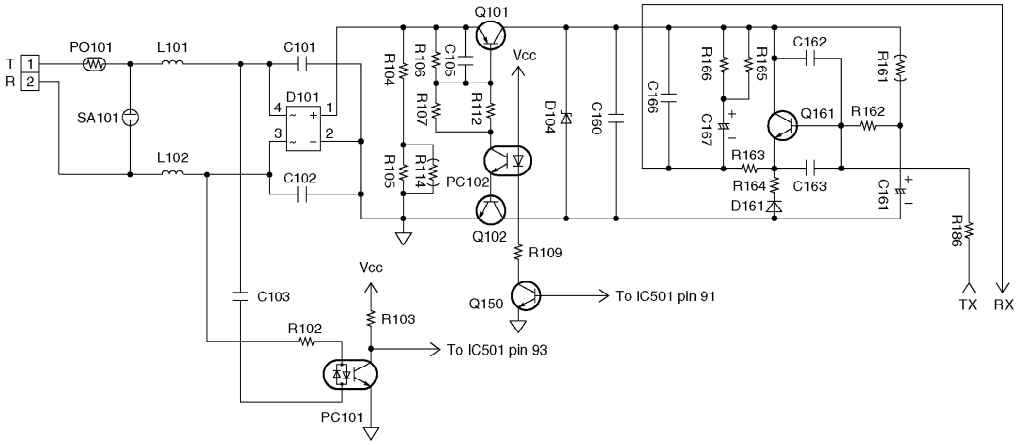
In the on-hook state (idle), the current flows between the telephone line and the unit is as follows :

T → PO101 → L101 → C103 → PC101 → R102 → L102 → R.

The DC component is blocked by C103: thereby providing an on-hook condition.

The AC interface impedance is over 47 kΩ; thus, satisfying the telephone company requirements.

Circuit Diagram



13.14.2. LINE 2

Circuit Operation:

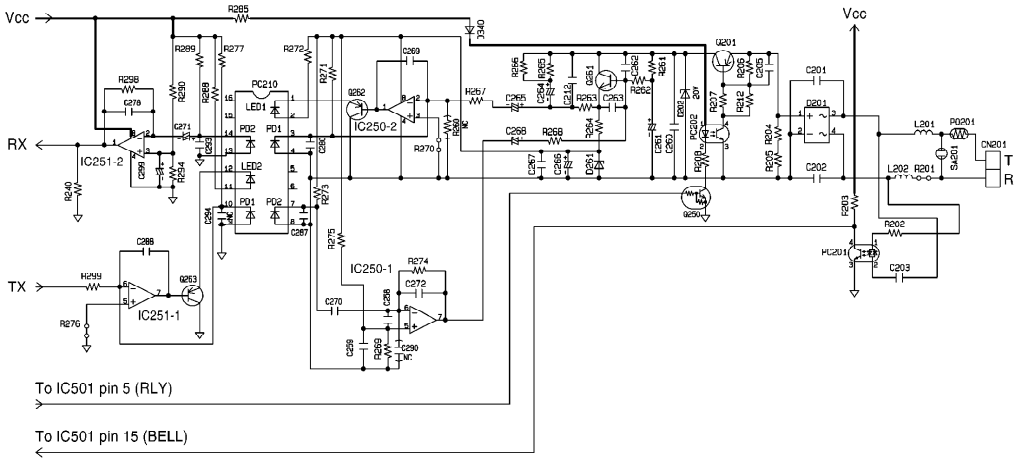
ANSWER

In the idle mode, Q201 is open to cut the DC loop current and decrease the ring load. When ring

voltage appears at the Tip (T) and Ring (R) leads (When the telephone rings), the AC ring voltage is transferred as follows:
T → L201 → C203 → PC201 → IC501 pin 15.
When the CPU (DSP) detects a ring signal, Q201 turns on, thus providing an off-hook condition (active DC current flow through the circuit) and the following signal flow is for the voice signal.
T → PO201 → L201 → D201 → Q201 → Q261 → R264 → C266 → D201 → L202 → R

ON HOOK
Q201 is open, Q201 is connected as to cut the DC loop current and to cut the voice signal. The unit is consequently in an on-hook condition.

SPECIFICATIONS
In the on-hook state (idle), the current flows between the telephone line and the unit is as follows :
T → PO201 → L201 → C203 → PC201 → R202 → L202 → R.
The DC component is blocked by C203: thereby providing an on-hook condition.
The AC interface impedance is over 47 kΩ ; thus, satisfying the telephone company requirements.



13.15. Intercom Mode

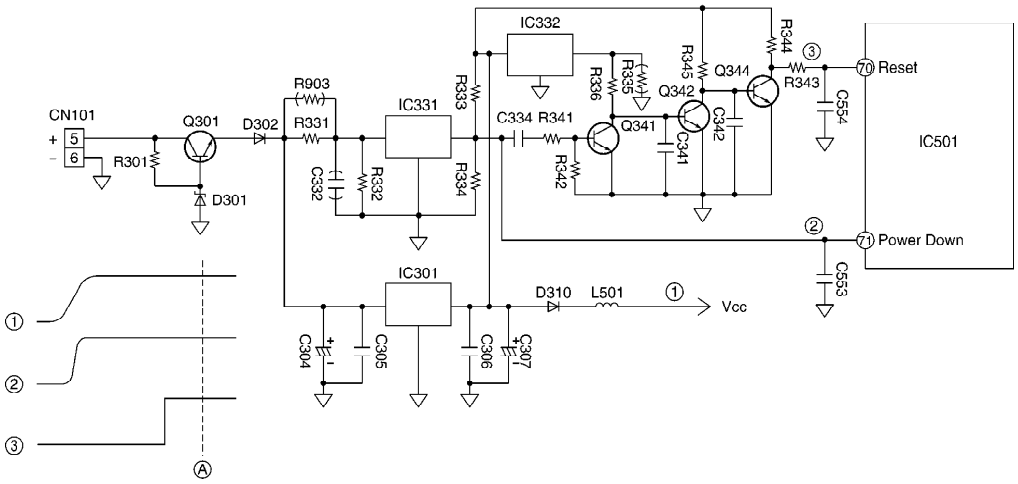
1. When the base unit LOCATOR/INTERCOM button is pressed, a call monitor signal (intercom sound) is output from pins 35 and 37 of IC501. Thus a monitor tone is heard from the speaker.
2. At the same time, flashing of the IN USE/CHARGE (LED501) is obtained from pin 101 of IC501. This status is called "Intercom stand-by".
3. The receiving signal flows:
   RF Unit RXADPCMOUT → IC501 pin 85 → pins 35 and 37 of IC501 → SP
4. The transmission signal flows:
   MIC+ → C425 → C418 → IC501 pin 61 → IC 501 pin 86 → RF Unit TXADPCMIN
   MIC– → C426 → C419 → IC501 pin 60 →

13.16. Initializing Circuit

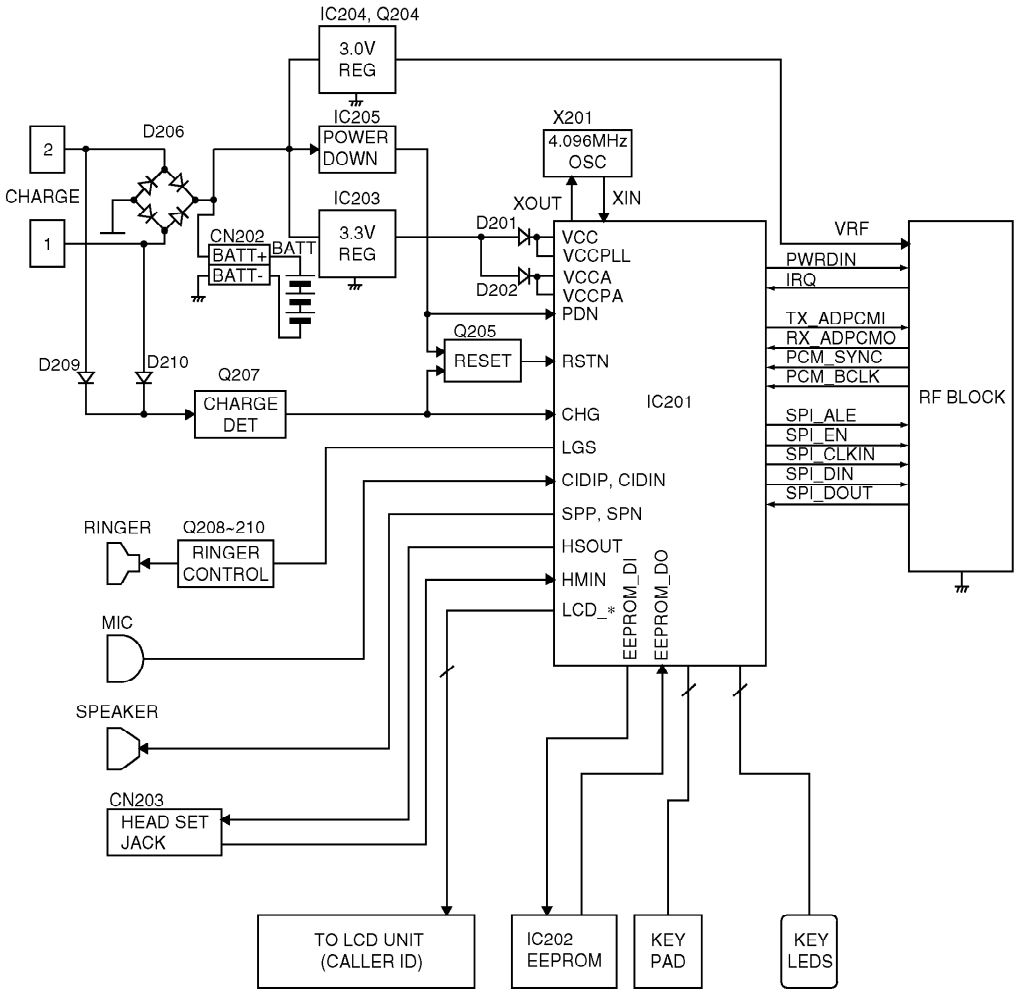
Function:
This circuit is used for to initialize the microcomputer when it incorporates an AC adaptor.

Circuit Operation:
When the AC Adaptor is inserted into the unit, then the voltage is shifted by IC301, D306 and power is supplied to the DSP.
The set can operate beyond point A in the circuit voltage diagram.

Circuit Diagram



14. BLOCK DIAGRAM (Handset)

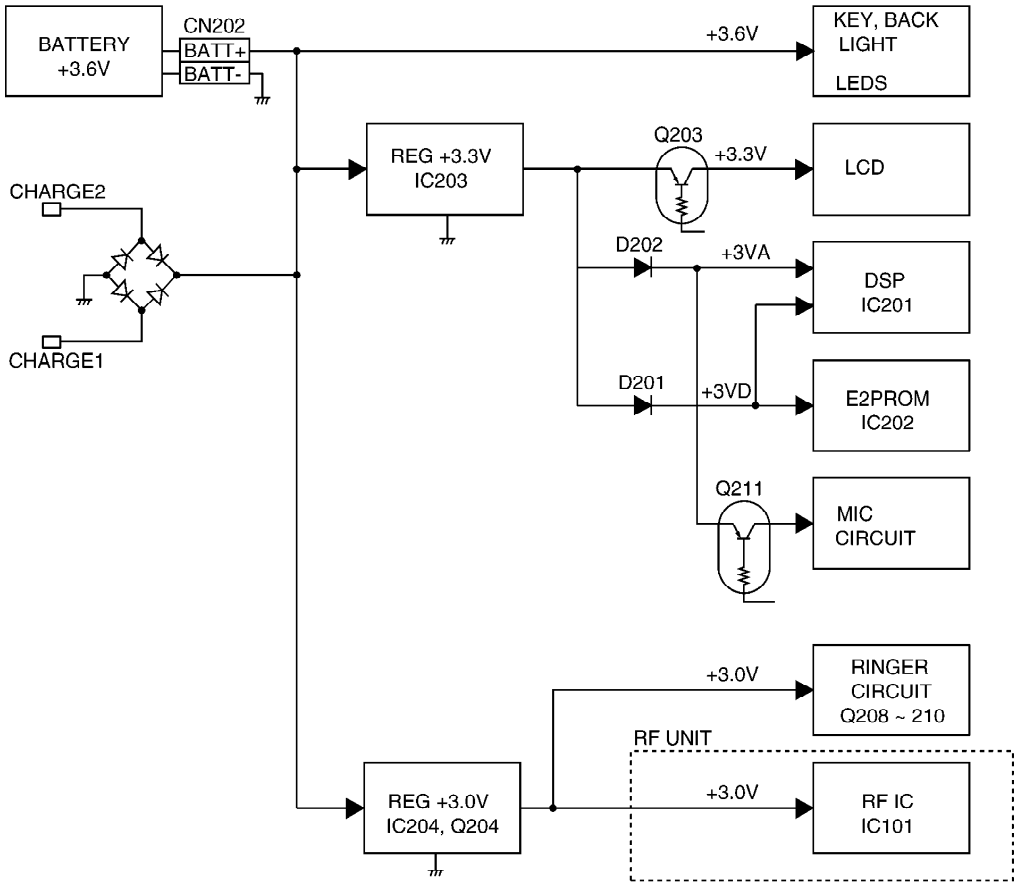


15. CIRCUIT OPERATION (Handset)

15.1. Power Supply Circuit

Voltage is supplied separately to each block.

Block Diagram (Handset Power)



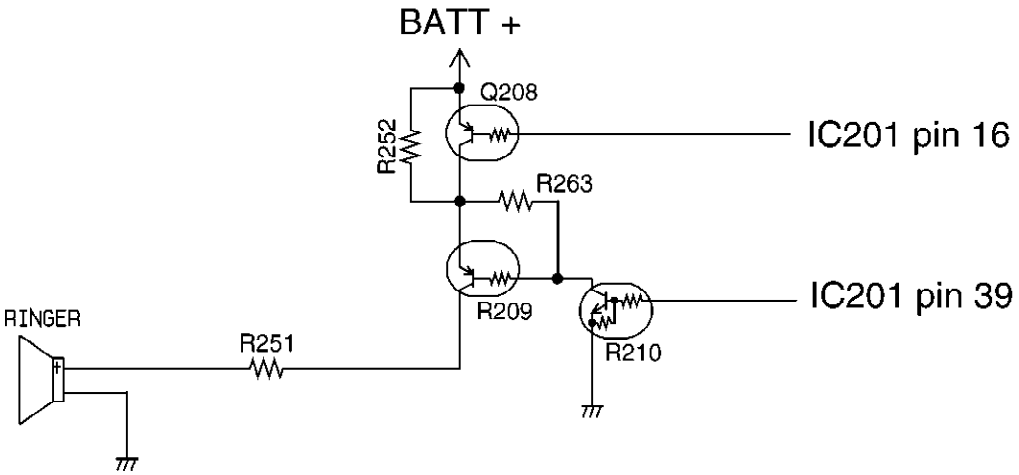
15.2. Charge Circuit

Ni-Cd battery is connected to CN202. When the handset is put on the cradle of the base unit, the power is supplied from CHARGE1 and CHARGE2 terminals to charge the battery. Q207 detects the voltage of CHARGE1 and CHARGE2 terminals, then the handset makes ID code setting with the base unit.

15.3. Ringer Circuit

If the ringer volume is set to low and an alarm tone is output from 39 pin, IC201 DSP and input to Q209. Then Q208 is turned off. If the ringer volume is set to high, Q208 turns on and results in a louder beep tone.

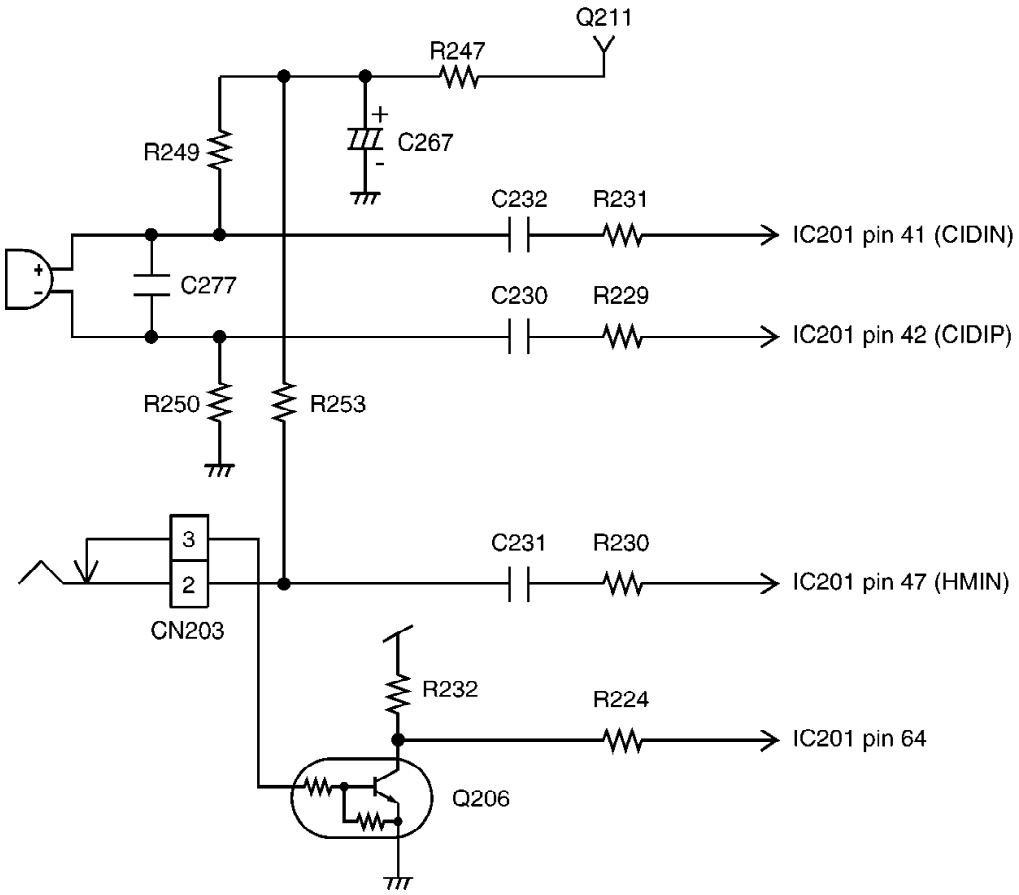
Circuit Diagram



15.4. Sending Signal

The voice signal from the microphone input to pin 42 (CIDIP) and pin 41(CIDIN) of IC201 (DSP). CN203 is the headphone jack. When the headphone is connected, the Q206 detect it. The input from the microphone of the handset (CIDIN, CIDIP) is cut and the microphone signal from the headphone is input to pin 47 of IC201 (HMIN). Also the power for the microphone is supplied from Q211, and the power is turned OFF on standby.

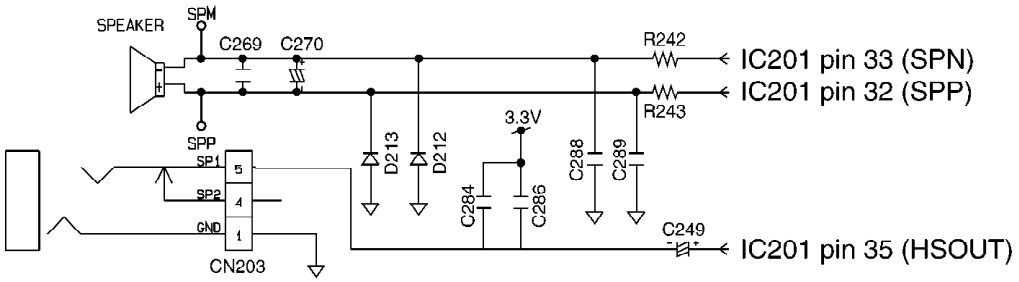
Circuit Diagram



15.5. Reception Signal Circuit

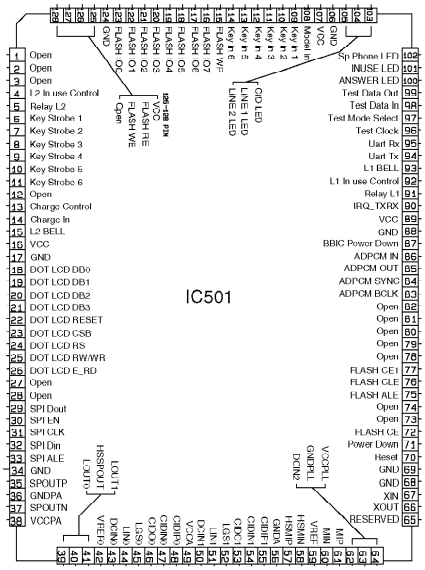
The received signal from the base unit is output from pins 33 (SPN) and 32 (SPP) of IC201 (DSP) as the voice signal. SPN is the inverse output of SPP, and the speaker is driven by SPN and SPP. CN203 is the headphone jack. When the headphone is connected to this jack, the output to the speaker of the handset (SPN,SPP) is cut and the voice signal is output to the headphone (HSOUT) only.

Circuit Diagram



16. CPU DATA (Base Unit)

16.1. IC501

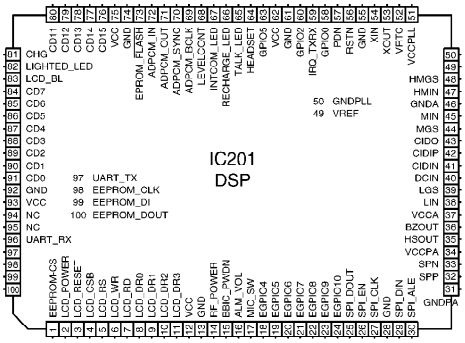


Pin	Description	I/O	High	Hi-z	Low
1	Open	D.O.	-	-	Always Low
2	Open	D.O.	-	-	Always Low
3	Open	D.O.	-	-	Always Low
4	L2 In use Control	D.O.	Line Release	-	Line Seize
5	Relay L2	D.O.	Seize Line	-	Release Line
6	Key Strobe 1	D.I.	Normal	-	Strobe On
7	Key Strobe 2	D.I.	Normal	-	Strobe On
8	Key Strobe 3	D.I.	Normal	-	Strobe On
9	Key Strobe 4	D.I.	Normal	-	Strobe On
10	Key Strobe 5	D.I.	Normal	-	Strobe On
11	Key Strobe 6	D.I.	Normal	-	Strobe On
12	Open	D.O.	-	-	Always Low
13	Charge Control	D.O.	Charge ON	-	Charge OFF
14	Charge In	D.I.	Off Charge	-	On Charge
15	L2 BELL	D.I.	Normal	-	Bell
16	VCC	VCC	Always High	-	-
17	GND	GND	-	-	Always Low
18	DOT LCD DB0	D.O.	Communication	-	Communication
19	DOT LCD DB1	D.O.	Communication	-	Communication
20	DOT LCD DB2	D.O.	Communication	-	Communication
21	DOT LCD DB3	D.O.	Communication	-	Communication
22	DOT LCD RESET	D.O.	Normal	-	Reset
23	DOT LCD CSB	D.O.	Communication	-	Communication
24	DOT LCD RS	D.O.	Communication	-	Communication
25	DOT LCD RW/WR	D.O.	Communication	-	Communication
26	DOT LCD E_RD	D.O.	Communication	-	Communication
27	Open	D.O.	-	-	Always Low
28	Open	D.O.	-	-	Always Low
29	SPI Dout	D.I.	Communication	-	Communication
30	SPI EN	D.O.	Communication	-	Communication
31	SPI CLK	D.O.	Communication	-	Communication
32	SPI Din	D.O.	Communication	-	Communication
33	SPI ALE	D.O.	Communication	-	Communication
34	GND	GND	-	-	Always Low
35	SPOUTP	A.O.	-	-	-
36	GNDPA	A.I.	-	-	-
37	SPOUTN	A.O.	-	-	-
38	VCCPA	A.I.	-	-	-
39	LOUT0	A.O.	-	-	-
40	HSSPOUT	A.O.	-	-	-
41	LOUT1	A.O.	-	-	-
42	VREF0	A.I.	-	-	-
43	DCIN0	A.I.	-	-	-

Pin	Description	I/O	High	Hi-z	Low
44	LIN0	A.I.	-	-	-
45	LGS0	A.I.	-	-	-
46	CIDO0	A.O.	-	-	-
47	CIDIN0	A.I.	-	-	-
48	CIDIP0	A.O.	-	-	-
49	VCCA	A.I.	-	-	-
50	DCIN1	A.I.	-	-	-
51	LIN1	A.I.	-	-	-
52	LGS1	A.O.	-	-	-
53	CIDO1	A.O.	-	-	-
54	CIDIN1	A.I.	-	-	-
55	CIDIP1	A.O.	-	-	-
56	GNDA	A.I.	-	-	-
57	HSMIP	A.I.	-	-	-
58	HSMIN	A.I.	-	-	-
59	VREF	A.I.	-	-	-
60	MIN	A.I.	-	-	-
61	MIP	A.I.	-	-	-
62	DCIN2	A.I.	-	-	-
63	GNDPLL	A.I.	-	-	-
64	VCCPLL	A.I.	-	-	-
65	RESERVED	OPEN	-	-	-
66	XOUT	D.O	-	-	-
67	XIN	D.O	-	-	-
68	GND	GND	-	-	Always Low
69	GND	GND	-	-	Always Low
70	Reset	A.I.	Normal	-	Reset
71	Power Down	A.I.	Normal	-	Power Down
72	FLASH CE	D.I.O.	Communication	-	Communication
73	Open	D.O.	-	-	Always Low
74	Open	D.O.	-	-	Always Low
75	FLASH ALE	D.I.O.	Communication	-	Communication
76	FLASH CLE	D.I.O.	Communication	-	Communication
77	FLASH CE1	D.I.O.	Communication	-	Communication
78	Open	D.O.	-	-	Always Low
79	Open	D.O.	-	-	Always Low
80	Open	D.O.	-	-	Always Low
81	Open	D.O.	-	-	Always Low
82	Open	D.O.	-	-	Always Low
83	ADPCM BCLK	D.I.O.	Communication	-	Communication
84	ADPCM SYNC	D.I.O.	Communication	-	Communication
85	ADPCM OUT	D.I.O.	Communication	-	Communication
86	ADPCM IN	D.I.O.	Communication	-	Communication
87	BBIC Power Down	D.O.	-	-	Always Low
88	GND	GND	-	-	Always Low
89	VCC	VCC	Always High	-	-
90	IRQ_TXRX	D.I.	Communication	-	Communication
91	Relay L1	D.O.	Seize Line	-	Release Line
92	L1 In use Control	D.O.	Line Release	-	Line Seize
93	L1 BELL	D.I.	Normal	-	Bell
94	Uart Tx	D.O.	Communication	-	Communication
95	Uart Rx	D.I.	Communication	-	Communication
96	Test Clock	I.O.	Communication	-	Communication
97	Test Mode Select	I.O.	Communication	-	Communication
98	Test Data In	I.O.	Communication	-	Communication
99	Test Data Out	I.O.	Communication	-	Communication
100	ANSWER LED	D.O.	off	-	on
101	INUSE LED	D.O.	off	-	on
102	Sp Phone LED	D.O.	off	-	on
103	CID LED	D.O.	off	-	on
104	LINE 1 LED	D.O.	off	-	on
105	LINE 2 LED	D.O.	off	-	on
106	GND	GND	-	-	Always Low
107	VCC	VCC	Always High	-	-
108	Model In	D.I.	1891	-	1881
109	Key In 1	D.I.	Normal	-	Key in
110	Key In 2	D.I.	Normal	-	Key in
111	Key In 3	D.I.	Normal	-	Key in
112	Key In 4	D.I.	Normal	-	Key in
113	Key In 5	D.I.	Normal	-	Key in
114	Key In 6	D.I.	Normal	-	Key in
115	FLASH WP	D.O.	Normal	-	Protect
116	FLASH IO7	D.I.O.	Communication	-	Communication
117	FLASH IO6	D.I.O.	Communication	-	Communication
118	FLASH IO5	D.I.O.	Communication	-	Communication
119	FLASH IO4	D.I.O.	Communication	-	Communication
120	FLASH IO3	D.I.O.	Communication	-	Communication
121	FLASH IO2	D.I.O.	Communication	-	Communication
122	FLASH IO1	D.I.O.	Communication	-	Communication
123	FLASH IO0	D.I.O.	Communication	-	Communication
124	GND	GND	-	-	Always Low
125	VCC	VCC	Always High	-	-
126	FLASH RE	D.I.O.	Communication	-	Communication
127	FLASH WE	D.I.O.	Communication	-	Communication
128	Open	D.O.	-	-	Always Low

17. CPU DATA (Handset)

17.1. IC201

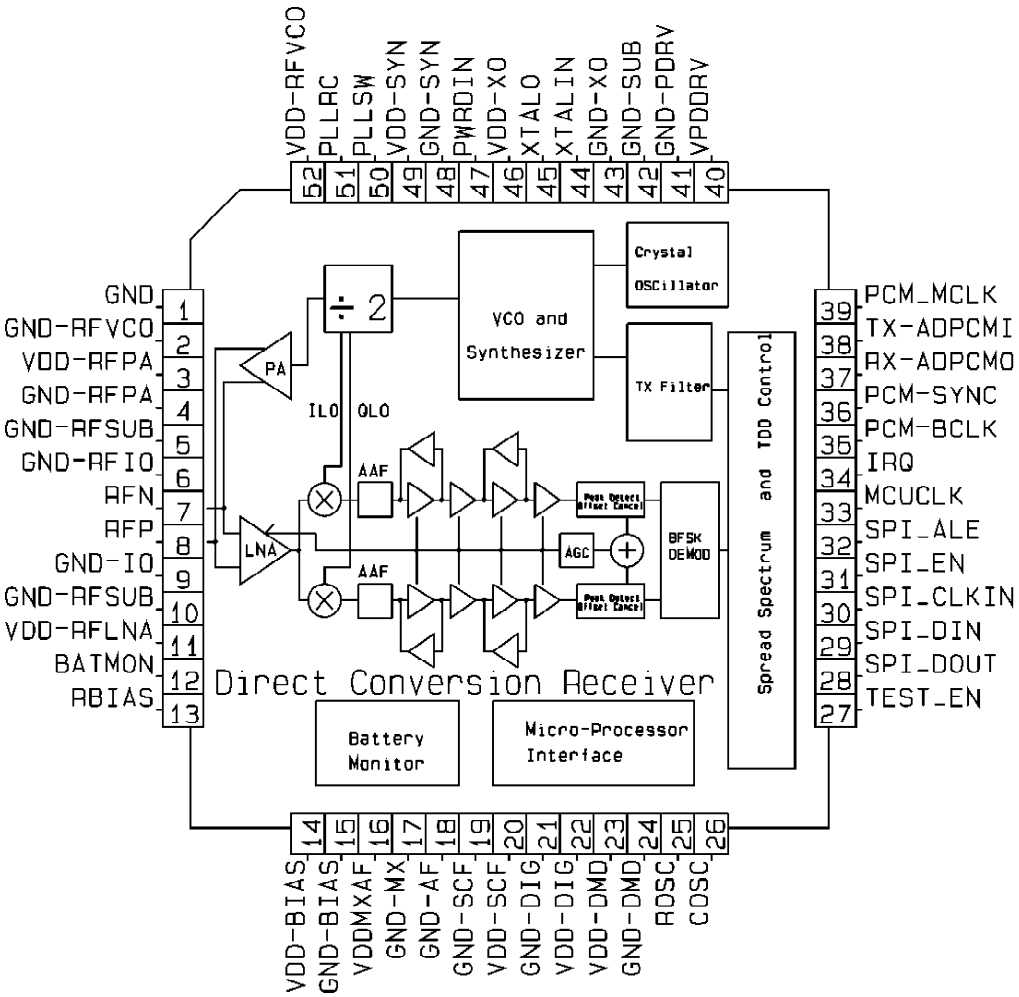


Pin	Description	I/O	High	High_Z	Low
1	EEPROM-CS	D.O	Active	-	Normal
2	LCD_PW_CTL	D.O	Off	-	On
3	LCD_RESET	D.O	Normal	-	Reset
4	LCD_CSB	D.O	-	-	Active
5	LCD_RS	D.O	Data	-	Instruction
6	LCD_WR	D.O	Read	-	Write
7	LCD_RD	D.O	Active	-	Normal
8	LCD_DA0	D.O	High	-	Low
9	LCD_DA1	D.O	High	-	Low
10	LCD_DA2	D.O	High	-	Low
11	LCD_DA3	D.O	High	-	Low
12	VCC	VCC	Vcc	-	-
13	GND	GND	-	-	GND
14	RF_PW_CTL	D.O	Off	-	On
15	BBIC_PDN	D.O	-	-	Active
16	ALM_VOL	D.O	Low	-	High
17	MIC_BIAS	D.O	Off	-	On
18	KEY_STB0	D.O	Strobe On	Strobe Off	-
19	KEY_STB1	D.O	Strobe On	Strobe Off	-
20	KEY_STB2	D.O	Strobe On	Strobe Off	-
21	KEY_STB3	D.O	Strobe On	Strobe Off	-
22	KEY_STB4	D.O	Strobe On	Strobe Off	-
23	KEY_STB5	D.O	Strobe On	Strobe Off	-
24	NC	D.O	-	-	Normal
25	SPI_OUT	D.O	High	-	Low
26	SPI_EN	D.O	Normal	-	Active
27	SPI_CLK	D.O	High	-	Low
28	GND	-	-	-	GND
29	SPI_DIN	D.I	High	-	Low
30	SPI_ALE	D.O	Address	-	Data
31	GNDPA	GND	-	-	GND
32	SPOUTP	A.O	-	-	-
33	SPOUTN	A.O	-	-	-
34	VCCPA	VCC	VCC	-	-
35	HSOUT	A.O	-	-	-
36	LOUT	A.O	-	-	-
37	VCCA	VCC	VCC	-	-
38	LIN	A.I	-	-	-
39	LGS	A.O	-	-	-
40	DCIN	A.I	-	-	-
41	CIDIN	A.I	-	-	-
42	CIDIP	A.I	-	-	-
43	CIDO	A.O	-	-	-
44	HMGS	A.O	-	-	-
45	HMIN	A.I	-	-	-
46	GNDA	GND	-	-	GND
47	MIN	A.I	-	-	-
48	MGS	A.O	-	-	-
49	VREF	A.O	-	-	-
50	GNDPLL	GND	-	-	GND

Pin	Description	I/O	High	High_Z	Low
51	VCCPLL	VCC	VCC	-	-
52	VRTC	VCC	VCC	-	-
53	XOUT	A.O	-	-	-
54	XIN	A.I	-	-	-
55	GND	GND	-	-	GND
56	RESET	D.I	Normal	-	Reset
57	PDN	D.I	Power On	-	Power Down
58	NC	D.O	-	-	Normal
59	IRQ_INT	D.I	Normal	-	Interrupt
60	NC	D.O	-	-	Normal
61	NC	D.O	-	-	Normal
62	NC	D.O	-	-	Normal
63	NC	D.O	-	-	Normal
64	HEAD_DET	D.I	Off	-	Headset
65	NC	D.O	Normal	-	-
66	NC	D.O	Normal	-	-
67	NC	D.O	Normal	-	-
68	NC	D.O	Normal	-	-
69	BCLK	D.I	High	-	Low
70	FSYNC	D.I	High	-	Low
71	ADPCM OUT	D.I	High	-	Low
72	ADPCM IN	D.O	High	-	Low
73	NC	D.O	-	-	Low
74	GND	GND	-	-	GND
75	VCC	VCC	VCC	-	-
76	KEY_SCAN0	D.I	On	-	Off
77	KEY_SCAN1	D.I	On	-	Off
78	KEY_SCAN2	D.I	On	-	Off
79	KEY_SCAN3	D.I	On	-	Off
80	KEY_SCAN4	D.I	On	-	Off
81	CHG_DET	D.I	Off Chrg	-	On Chrg
82	LIGH_LED	D.O	On	-	Off
83	LCD_BL	D.O	On	-	Off
84	NC	D.O	-	-	Normal
85	NC	D.O	-	-	Normal
86	NC	D.O	-	-	Normal
87	NC	D.O	-	-	Normal
88	NC	D.O	-	-	Normal
89	NC	D.O	-	-	Normal
90	NC	D.O	-	-	Normal
91	NC	D.O	-	-	Normal
92	GND	GND	-	-	GND
93	VCC	VCC	VCC	-	-
94	NC	VCC	VCC	-	-
95	NC	GND	-	-	GND
96	UART_TX	D.O	High	-	Low
97	UART_RX	D.I	High	-	Low
98	EEP_CLK	D.O	High	-	Low
99	EEP_DI	D.I	High	-	Low
100	EEP_DOUT	D.O	High	-	Low

18. EXPLANATION OF IC TERMINALS (RF Unit)

18.1. IC101


VDD-RFVCO
PLLRC
PLLSW
VDD-SYN
GND-SYN
PWRDIN
VDD-XO
XTALO
XTALIN
GND-XO
GND-SUB
GND-PDRV
VPDDRV
52
51
50
49
48
47
46
45
44
43
42
41
40
GND
GND-RFVCO
VDD-RFPA
GND-RFPA
GND-RFSUB
GND-RFIO
RFN
RFP
GND-IO
GND-RFSUB
VDD-RFLNA
BATMON
RBIAS
1
2
3
4
5
6
7
8
9
10
11
12
13
÷ 2
VCO and Synthesizer
Crystal OSCillator
TX Filter
PA
LNA
ILO
QLO
AAF
AAF
AGC
BFSK DEMOD
Spread Spectrum and TDD Control
Direct Conversion Receiver
Battery Monitor
Micro-Processor Interface
39
38
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28
27
PCM_MCLK
TX-ADPCMI
RX-ADPCMO
PCM-SYNC
PCM-BCLK
IRQ
MCUCLK
SPI_ALE
SPI_EN
SPI_CLKIN
SPI_DIN
SPI_DOUT
TEST_EN
14
15
16
17
18
19
20
21
22
23
24
25
26
VDD-BIAS
GND-BIAS
VDDMXAF
GND-MX
GND-AF
GND-SCF
VDD-SCF
GND-DIG
VDD-DIG
VDD-DMD
GND-DMD
ROSC
COSC

Pin	Description	I/O
1	GND	NA
2	GND-RFVCO	NA
3	VDD-RFPA	NA
4	GND-RFPA	NA
5	GND-RFSUB	NA
6	GND-RFIO	NA
7	RFN	I/O
8	RFP	I/O
9	GND-RFIO	NA
10	GND-RFSUB	NA
11	VDD-RFLNA	NA
12	BATMON	I
13	RBIAS	NA
14	VDD-BIAS	NA
15	GND-BIAS	NA
16	VDD-MXAF	NA
17	GND-MX	NA
18	GND-AF	NA
19	GND-SCF	NA
20	VDD-SCF	NA
21	GND-DIG	NA
22	VDD-DIG	NA
23	VDD-DMD	NA
24	GND-DMD	NA
25	ROSC	NA
26	COSC	NA

Pin	Description	I/O
27	TEST_EN	I
28	SPI_DOUT	O
29	SPI_DIN	I
30	SPI_CLKIN	I
31	SPI_EN	I
32	SPI_ALE	I
33	MCUCLK	O
34	IRQ	O
35	PCM_BCLK	O
36	PCM_SYNC	O
37	RX_ADPCMO	O
38	TX_ADPCMI	I
39	PCM_MCLK	O
40	VPDDRV	NA
41	GND-PDRV	NA
42	GND-SUB	NA
43	GND-XO	NA
44	XTALIN	I
45	XTALO	O
46	VDD-XO	NA
47	PWRDIN	I
48	GND-SYN	NA
49	VDD-SYN	NA
50	PLLSW	NA
51	PLLRC	NA
52	VDD-RFVCO	NA

19. HOW TO REPLACE FLAT PACKAGE IC

19.1. Preparation

- SOLDER

Sparkle Solder 115A-1, 115B-1 or Almit Solder KR-19, KR-19RMA

- Soldering iron

Recommended power consumption will be between 30 W to 40 W.
Temperature of Copper Rod 662 ± 50°F (350 ± 10°C)
(An expert may handle between 60 W to 80 W iron, but beginner might damage foil by overheating.)

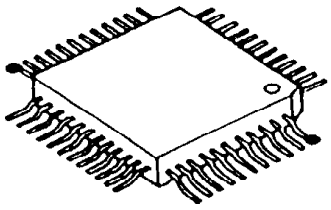
- Flux

HI115 Specific gravity 0.863

(Original flux will be replaced daily.)

19.2. Procedure

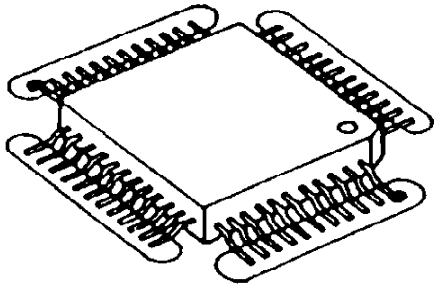
1. Temporary fix FLAT PACKAGE IC by soldering on two marked 2 pins.



● - - - - - - Temporary soldering point.

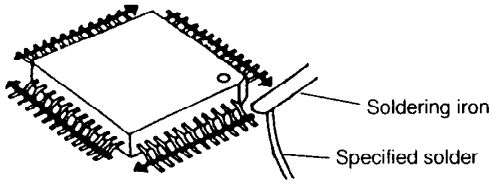
***Most important matter is accurate setting of IC to the corresponding soldering foil.**

2. Apply flux for all pins of FLAT PACKAGE IC.



Flux

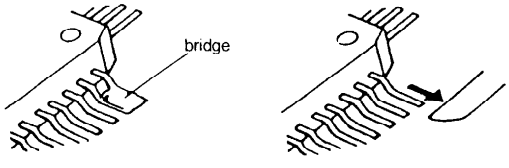
3. Solder employing specified solder to direction of arrow, as sliding the soldering iron.



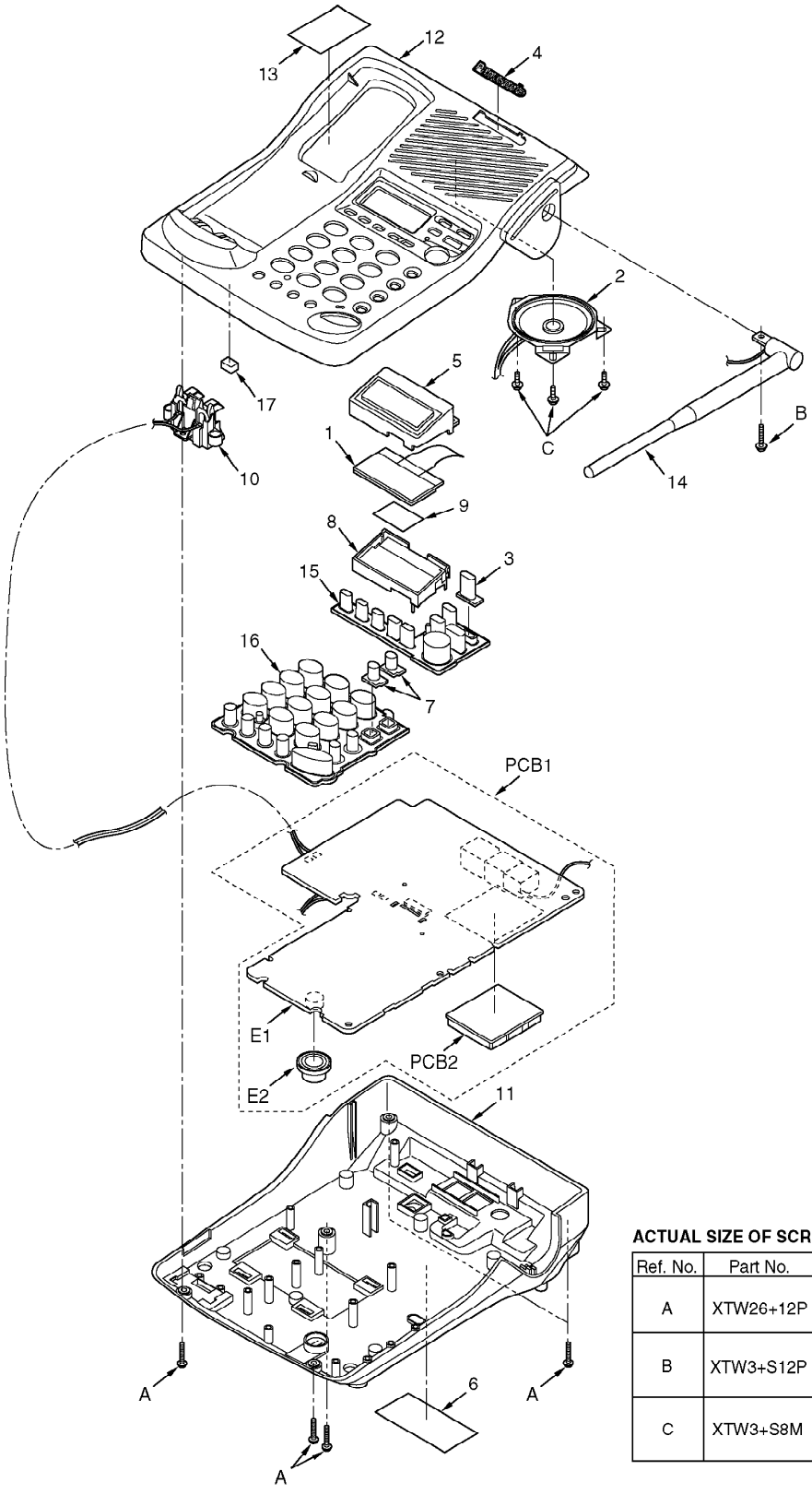
19.3. Modification Procedure of Bridge

1. Re-solder slightly on bridged portion.

2. Remove remained solder along pins employing soldering iron as shown in below figure.



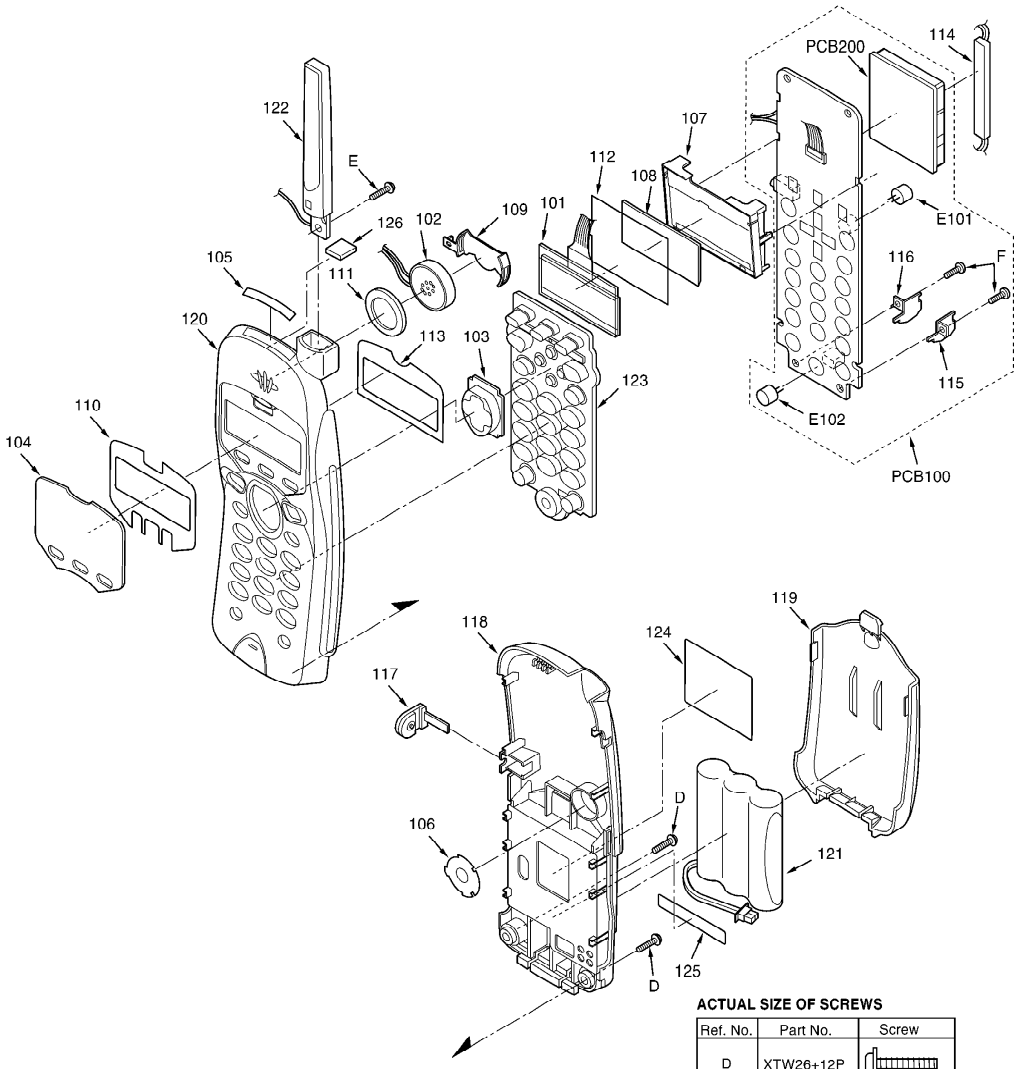
20. CABINET AND ELECTRICAL PARTS (Base Unit)



ACTUAL SIZE OF SCREWS

Ref. No.	Part No.	Screw
A	XTW26+12P	
B	XTW3+S12P	
C	XTW3+S8M	

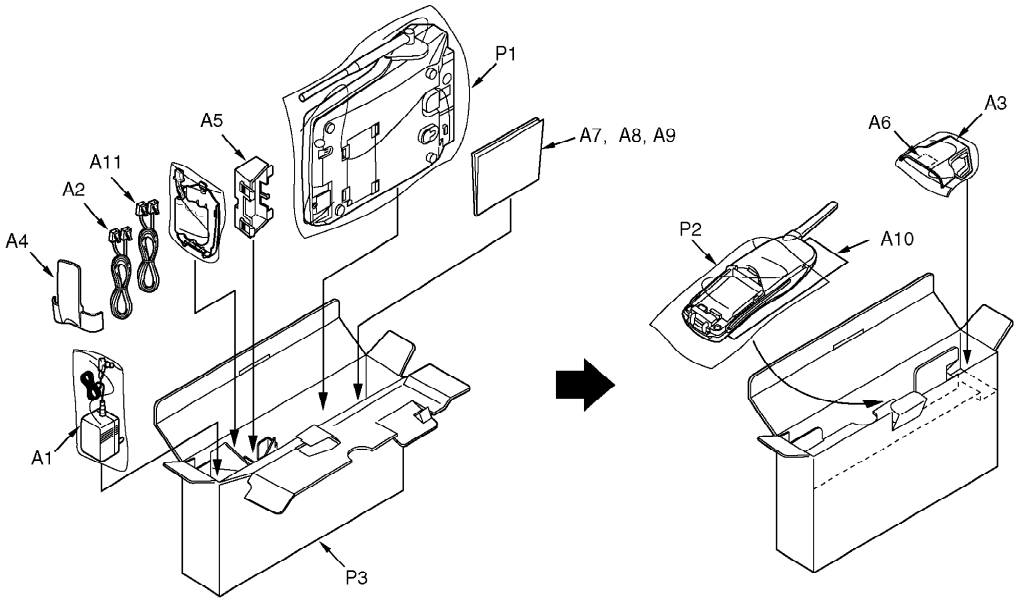
21. CABINET AND ELECTRICAL PARTS (Handset)



ACTUAL SIZE OF SCREWS

Ref. No.	Part No.	Screw
D	XTW26+12P	
E	XTW26+12P	
F	XTB26+8J	

22. ACCESSORIES AND PACKING MATERIALS



23. REPLACEMENT PARTS LIST

This replacement parts list are U.S.A. version only.
Note:

1. **RTL (Retention Time Limited)**
   The marking (RTL) indicates that the Retention Time is limited for this item.
   After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retention period of availability is dependent on the type of assembly, and in accordance with the laws governing part and product retention.
   After the end of this period, the assembly will no longer be available.
2. **Important safety notice**
   Components identified by a ⚠ mark special characteristics important for safety. When replacing any of these components, use only manufacture's specified parts.
3. **The S mark indicates service standard parts and may differ from production parts.**
4. **RESISTORS & CAPACITORS**
   Unless otherwise specified;
   All resistors are in ohms (Ω) K=1000 Ω , M=1000k Ω
   All capacitors are in MICRO FARADS (μ F) P= μ μ F

*Type & Wattage of Resistor

Type

ERC:Solid ERD:Carbon PQRD:Carbon	ERX:Metal Film ERG:Metal Oxide ER0:Metal Film	PQ4R:Carbon ERS:Fusible Resistor ERF:Cement Resistor

Wattege

10,16:1/8W	14,25:1/4W	12:1/2W	1:1W	2:2W	3:3W

*Type & Voltage of Capacitor

Type

ECFD:Semi-Conductor ECQS:Styrol PQCUV:Chip ECQMS:Mica	ECCD,ECKD,ECBT,PQCBC:Ceramic ECQE,ECQV,ECQG:Polyester ECEA,ECSZ:Electlytic ECQP:Polypropylene

Voltage

ECQ Type	ECQG ECQV Type	ECSZ Type	Others	
1H:50V 2A:100V 2E:250V 2H:500V	05:50V 1:100V 2:200V	0F:3.15V 1A:10V 1V:35V 0J:6.3V	0J :6.3V 1A :10V 1C :16V 1E,25:25V	1V :35V 50,1H:50V 1J :63V 2A :100V

23.1. Base Unit

23.1.1. CABINET AND ELECTRICAL PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
1	PQADGP0821GN	LIQUID CRYSTAL DISPLAY	S
2	PQAS57P03Y	SPEAKER	
3	PQBC10305Z1	C-ID BUTTON	S
4	PQGB7Y	BADGE	
5	PQGP10166Z1	LCD PANEL	S
6	PQGT14076Z	NAME PLATE	
7	PQBC10306Z1	LINE SELECT BUTTON	S
8	PQHR10755Z	LCD HOLDER	
9	PQHS10446Z	DOUBLE SIDE TAPE	
10	PQWE10022Z	CHARGE TERMINAL	
11	PQYF10171Y1	LOWER CABINET	S
12	PQKM10439V1	UPPER CABINET	S
13	PQQT22085Z	TAM LABEL	
14	PQSA10095Z	ANTENNA	S
15	PQSX10138X	RUBBER SWITCH, TAM	
16	PQSX10143Z	RUBBER SWITCH, 21KEY	
17	PQHG10635Z	RUBBER	

23.1.2. MAIN P.C. BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB1	PQWPTC1891BH	MAIN P.C.BOARD ASS'Y (RTL)	
		(ICS)	
IC121	PQVINJM2904V	IC	S
IC141	PQVINJM2904V	IC	S
IC221	PQVINJM2904V	IC	S
IC241	PQVINJM2904V	IC	S
IC250	PQVINJM2904V	IC	S
IC251	PQVINJM2904V	IC	S
IC301	PQVIXCF4002P	IC	S
IC331	PQVIPS3432UT	IC	S
IC332	C0EBD0000067	IC	
IC341	PQVIXCF5502P	IC	
IC501	C2HBBG000017	IC	
IC701	PQWITC1891BH	IC	
		(TRANSISTORS)	
Q101	2SA1972	TRANSISTOR(SI)	S
Q102	2SC4645EAN	TRANSISTOR(SI)	S
Q141	UN5213	TRANSISTOR(SI)	S
Q142	UN5213	TRANSISTOR(SI)	S
Q150	UN5213	TRANSISTOR(SI)	S
Q161	2SC2120	TRANSISTOR(SI)	S
Q162	2SD1819A	TRANSISTOR(SI)	S
Q164	2SD1819A	TRANSISTOR(SI)	S
Q170	2SD1819A	TRANSISTOR(SI)	S
Q201	2SA1972	TRANSISTOR(SI)	S
Q241	UN5213	TRANSISTOR(SI)	S
Q242	UN5213	TRANSISTOR(SI)	S
Q250	UN5213	TRANSISTOR(SI)	S
Q261	2SC2120	TRANSISTOR(SI)	S
Q262	2SB1218A	TRANSISTOR(SI)	
Q263	2SB1218A	TRANSISTOR(SI)	
Q264	2SD1819A	TRANSISTOR(SI)	S
Q270	2SD1819A	TRANSISTOR(SI)	S
Q301	2SD2136	TRANSISTOR(SI)	
Q302	2SD2136	TRANSISTOR(SI)	
Q303	2SD1758Q	TRANSISTOR(SI)	S
Q304	2SD1758Q	TRANSISTOR(SI)	S
Q321	2SD1819A	TRANSISTOR(SI)	S
Q341	2SD1819A	TRANSISTOR(SI)	S
Q342	2SD1819A	TRANSISTOR(SI)	S
Q344	2SD1819A	TRANSISTOR(SI)	S
Q350	2SD1819A	TRANSISTOR(SI)	S
Q371	2SD2136	TRANSISTOR(SI)	
Q381	2SD1819A	TRANSISTOR(SI)	S
		(DIODES)	
D101	PQVDS1ZB60F1	DIODE(SI)	
D104	PQVDRLZ20A	DIODE(SI)	S
D170	MA153	DIODE(SI)	S
D201	PQVDS1ZB60F1	DIODE(SI)	
D202	PQVDRLZ20A	DIODE(SI)	S
D261	PQVDRLZ5R1	DIODE(SI)	
D270	MA153	DIODE(SI)	S
D301	PQVDRLZ6R8	DIODE(SI)	S
D302	PQVDHRU0302A	DIODE(SI)	S

Ref. No.	Part No.	Part Name & Description	Remarks
D303	MA8039	DIODE(SI)	
D306	MA111	DIODE(SI)	
D307	PQVDRLZ8R2	DIODE(SI)	
D309	MA111	DIODE(SI)	
D310	MA111	DIODE(SI)	
D312	MA111	DIODE(SI)	
D321	MA8047	DIODE(SI)	
D340	MA111	DIODE(SI)	
D360	MA8036H	DIODE(SI)	
D371	MA111	DIODE(SI)	
D376	PQVDRLZ20A	DIODE(SI)	S
D377	PQVDRLZ20A	DIODE(SI)	S
D401	MA8051	DIODE(SI)	
D402	MA8051	DIODE(SI)	
D501	MA111	DIODE(SI)	
DA121	MA153	DIODE(SI)	S
DA122	MA153	DIODE(SI)	S
DA221	MA153	DIODE(SI)	S
DA222	MA153	DIODE(SI)	S
		(LEDS)	
LED501	PQVDSML310MT	LED	S
LED502	PQVDBR1111C	LED	S
LED503	PQVDBR1111C	LED	S
LED504	PQVDBR1111C	LED	S
LED505	PQVDBR1111C	LED	S
LED701	PQVDBR1111C	LED	S
		(CONNECTORS)	
CN101	PQJJ2H004Z	CONNECTOR	S
CN201	PQJJ1T020Z	CONNECTOR	
CN721	PQJS22B11Z	FPC CONNECTOR	
		(COILS)	
L101	PQLQXF330K	COIL	S
L102	PQLQXF330K	COIL	S
L201	PQLQXF330K	COIL	S
L202	PQLQXF330K	COIL	S
L301	PQLQXF330K	COIL	S
L302	PQLQXF100K	COIL	S
L376	PQLQZK3R3K	COIL	S
L377	PQLQZM100K	COIL	S
L501	PQLQR2KA213	COIL	S
L517	PQLQR2K1A102	COIL	
C603	MQLRE3N3DF	COIL	
C604	MQLRE15NJF	COIL	
		(PHOTO ELECTRIC TRANSDUCERS)	
PC101	0N3181	PHOTO ELECTRIC TRANSDUCER	
PC102	PQVITLP627	PHOTO ELECTRIC TRANSDUCER	S
PC201	0N3181	PHOTO ELECTRIC TRANSDUCER	
PC202	PQVITLP627	PHOTO ELECTRIC TRANSDUCER	S
PC210	B3PBZ0000006	PHOTO ELECTRIC TRANSDUCER	
		(SURGE ABSORBERS)	
SA101	PQVDDSS301L	SURGE ABSORBER	
SA102	PQVDDSS301L	SURGE ABSORBER	
SA201	PQVDDSS301L	SURGE ABSORBER	
SA202	PQVDDSS301L	SURGE ABSORBER	

Ref. No.	Part No.	Part Name & Description	Remarks
		(THERMISTORS)	
PO101	PQRPAR390N	THERMISTOR	S
PO201	PQRPAR390N	THERMISTOR	S
		(OTHERS)	
E1	PQJM147Y	MICROPHONE	S
E2	PQMG10023Z	CUSHION RUBBER, MIC	
G601	PQJT10152Z	CHARGE TERMINAL	
G602	PQJT10152Z	CHARGE TERMINAL	
G603	PQJT10152Z	CHARGE TERMINAL	
G604	PQJT10152Z	CHARGE TERMINAL	
G605	PQJT10152Z	CHARGE TERMINAL	
G606	PQJT10152Z	CHARGE TERMINAL	
RA601	EXRV8V221JV	RESISTOR ARRAY	
X801	PQVCK4096N9Z	CRYSTAL OSCILLATOR	S
		(RESISTORS)	
R102	PQ4R10XJ473	47k	S
R103	ERJ3GEYJ103	10k	
R104	PQ4R10XJ106	10M	S
R105	PQ4R10XJ106	10M	S
R106	PQ4R10XJ104	100k	S
R107	ERJ3GEYJ103	10k	
R108	PQ4R10XJ104	100k	S
R109	ERJ3GEYJ472	4.7k	
R112	ERJ3GEYJ103	10k	
R121	ERJ3GEYJ225	2.2M	
R122	ERJ3GEYJ225	2.2M	
R123	ERJ3GEYJ564	560k	
R124	ERJ3GEYJ564	560k	
R125	ERJ3GEYJ335	3.3M	
R126	ERJ3GEYJ223	22k	
R127	ERJ3GEYJ335	3.3M	
R128	ERJ3GEYJ103	10k	
R129	ERJ3GEYJ473	47k	
R130	ERJ3GEYJ473	47k	
R131	ERJ3GEYJ472	4.7k	
R132	ERJ3GEYJ473	47k	
R134	ERJ3GEYJ103	10k	
R135	ERJ3GEYJ223	22k	
R136	ERJ3GEYJ473	47k	
R137	ERJ3GEYJ683	68k	
R138	ERJ3GEYJ683	68k	
R139	ERJ3GEYJ104	100k	
R141	PQ4R10XJ825	8.2M	S
R142	PQ4R10XJ825	8.2M	S
R143	ERJ3GEYJ824	820k	
R144	ERJ3GEYJ824	820k	
R145	ERJ3GEYJ104	100k	
R146	ERJ3GEYJ563	56k	
R147	ERJ3GEYJ683	68k	
R148	ERJ3GEYJ102	1k	
R149	ERJ3GEYJ473	47k	
R150	ERJ3GEYJ473	47k	
R151	ERJ3GEYJ122	1.2k	
R152	ERJ3GEYJ102	1k	

Ref. No.	Part No.	Part Name & Description	Remarks
R153	ERJ3GEYJ103	10k	
R154	ERJ3GEYJ472	4.7k	
R155	ERJ3GEYJ104	100k	
R157	ERJ3GEYJ103	10k	
R158	ERJ3GEYJ103	10k	
R160	ERJ3GEYJ101	100	
R161	ERJ3GEYJ102	1k	
R162	ERJ3GEYJ153	15k	
R163	ERJ3GEYJ470	47	
R164	ERDS1VJ270	27	
R165	ERJ3GEYJ152	1.5k	
R166	ERJ3GEYJ122	1.2k	
R167	ERJ3GEYJ102	1k	
R168	ERJ3GEYJ394	390k	
R169	ERJ3GEYJ562	5.6k	
R170	ERJ3GEYJ561	560	
R171	ERJ3GEYJ332	3.3k	
R179	ERJ3GEYJ222	2.2k	
R182	ERJ3GEYJ394	390k	
R183	ERJ3GEYJ332	3.3k	
R184	ERJ3GEYJ221	220	
R186	ERJ3GEYJ183	18k	
R189	ERJ3GEYJ822	8.2k	
R192	ERJ3GEYJ392	3.9k	
R194	ERJ3GEYJ564	560k	
R195	ERJ3GEYJ105	1M	
R196	ERJ3GEYJ151	150	
R197	ERJ3GEYJ332	3.3k	
R202	PQ4R10XJ473	47k	S
R203	ERJ3GEYJ103	10k	
R204	PQ4R10XJ106	10M	S
R205	PQ4R10XJ106	10M	S
R206	PQ4R10XJ104	100k	S
R207	ERJ3GEYJ103	10k	
R208	ERJ3GEYJ472	4.7k	
R212	ERJ3GEYJ103	10k	
R221	ERJ3GEYJ225	2.2M	
R222	ERJ3GEYJ225	2.2M	
R223	ERJ3GEYJ564	560k	
R224	ERJ3GEYJ564	560k	
R225	ERJ3GEYJ335	3.3M	
R226	ERJ3GEYJ104	100k	
R227	ERJ3GEYJ335	3.3M	
R228	ERJ3GEYJ103	10k	
R229	ERJ3GEYJ473	47k	
R230	ERJ3GEYJ473	47k	
R231	ERJ3GEYJ472	4.7k	
R232	ERJ3GEYJ473	47k	
R233	ERJ3GEYJ104	100k	
R234	ERJ3GEYJ103	10k	
R235	ERJ3GEYJ104	100k	
R236	ERJ3GEYJ473	47k	
R237	ERJ3GEYJ683	68k	
R238	ERJ3GEYJ683	68k	

Ref. No.	Part No.	Part Name & Description	Remarks
R239	ERJ3GEYJ104	100k	
R240	ERJ3GEYJ103	10k	
R241	PQ4R10XJ825	8.2M	S
R242	PQ4R10XJ825	8.2M	S
R243	ERJ3GEYJ824	820k	
R244	ERJ3GEYJ824	820k	
R245	ERJ3GEYJ104	100k	
R246	ERJ3GEYJ563	56k	
R247	ERJ3GEYJ683	68k	
R248	ERJ3GEYJ102	1k	
R249	ERJ3GEYJ473	47k	
R250	ERJ3GEYJ473	47k	
R251	ERJ3GEYJ122	1.2k	
R252	ERJ3GEYJ102	1k	
R253	ERJ3GEYJ103	10k	
R255	ERJ3GEYJ104	100k	
R256	ERJ3GEYJ472	4.7k	
R257	ERJ3GEYJ103	10k	
R258	ERJ3GEYJ103	10k	
R261	ERJ3GEYJ102	1k	
R262	ERJ3GEYJ153	15k	
R263	ERJ3GEYJ470	47	
R264	ERDS1VJ270	27	
R265	ERJ3GEYJ152	1.5k	
R266	ERJ3GEYJ122	1.2k	
R267	ERJ3GEYJ332	3.3k	
R268	ERJ3GEYJ562	5.6k	
R269	ERJ3GEYJ103	10k	
R271	ERJ3GEYJ104	100k	
R272	ERJ3GEYJ221	220	
R273	ERJ3GEYJ103	10k	
R274	ERJ3GEYJ472	4.7k	
R275	ERJ3GEYJ103	10k	
R277	ERJ3GEYJ104	100k	
R278	ERJ3GEY0R00	0	
R279	ERJ3GEYJ182	1.8k	
R280	ERJ3GEYJ394	390k	
R281	ERJ3GEYJ561	560	
R282	ERJ3GEYJ332	3.3k	
R283	ERJ3GEY0R00	0	
R285	ERJ3GEYJ101	100	
R286	ERJ3GEYJ822	8.2k	
R288	ERJ3GEYJ331	330	
R289	ERJ3GEYJ103	10k	
R290	ERJ3GEYJ103	10k	
R291	ERJ3GEYJ564	560k	
R292	ERJ3GEYJ105	1M	
R293	ERJ3GEYJ102	1k	
R294	ERJ3GEYJ103	10k	
R295	ERJ3GEYJ222	2.2k	
R297	ERJ3GEYJ332	3.3k	
R298	ERJ3GEYJ473	47k	
R299	ERJ3GEYJ103	10k	
R301	ERD25TJ221	220	S

Ref. No.	Part No.	Part Name & Description	Remarks
R302	ERJ3GEYJ471	470	
R303	ERJ3GEYJ221	220	
R321	ERJ3GEYJ152	1.5k	
R324	ERJ3GEYJ104	100k	
R325	ERJ3GEYJ102	1k	
R331	ERJ3GEYJ273	27k	
R332	ERJ3GEYJ104	100k	
R333	ERJ3GEYJ223	22k	
R334	ERJ3GEYJ104	100k	
R336	ERJ3GEYJ474	470k	
R341	ERJ3GEYJ473	47k	
R342	ERJ3GEYJ224	220k	
R343	ERJ3GEY0R00	0	
R344	ERJ3GEYJ563	56k	
R345	ERJ3GEYJ124	120k	
R347	ERJ3GEY0R00	0	
R350	ERJ3GEYJ471	470	
R371	ERJ3GEYJ121	120	
R372	ERJ3GEYJ561	560	
R373	ERJ3GEYJ220	22	
R374	ERJ3GEYJ220	22	
R375	ERJ3GEYJ180	18	
R376	ERJ3GEYJ180	18	
R377	ERDS1VJ221	220	
R378	ERDS1VJ391	390	
R381	ERJ3GEYJ563	56k	
R382	ERJ3GEYJ563	56k	
R383	ERJ3GEYJ103	10k	
R400	ERJ3GEYJ222	2.2k	
R405	ERJ3GEYJ102	1k	
R406	ERJ3GEYJ222	2.2k	
R420	ERJ3GEYJ562	5.6k	
R421	ERJ3GEYJ562	5.6k	
R503	ERJ3GEYJ271	270	
R504	ERJ3GEYJ391	390	
R505	ERJ3GEYJ391	390	
R506	ERJ3GEYJ391	390	
R507	ERJ3GEYJ391	390	
R513	ERJ3GEYJ472	4.7k	
R541	ERJ3GEYJ101	100	
R542	ERJ3GEYJ101	100	
R543	ERJ3GEYJ472	4.7k	
R586	ERJ3GEYJ104	100k	
R601	ERJ3GEYJ221	220	
R602	ERJ3GEYJ221	220	
R701	ERJ3GEYJ104	100k	
R702	ERJ3GEYJ104	100k	
R703	ERJ3GEYJ221	220	
R704	ERJ3GEYJ221	220	
R705	ERJ3GEYJ221	220	
R706	ERJ3GEYJ221	220	
R707	ERJ3GEY0R00	0	
R708	ERJ3GEYJ391	390	
R721	ERJ3GEYF824	820k	S

Ref. No.	Part No.	Part Name & Description	Remarks
R722	ERJ3GEYF474	470k	S
R734	ERJ3GEYJ103	10k	
R808	ERJ3GEYJ104	100k	
C803	ERDS1VJ221	220	
D102	PQ4R18XJ000	0	S
D103	PQ4R18XJ000	0	S
D163	PQ4R10XJ000	0	S
D262	PQ4R10XJ000	0	S
L371	ERD25VJ0	0	S
		(CAPACITORS)	
C101	ECUV2H681KB	680P	S
C102	ECUV2H681KB	680P	S
C103	ECQE2224KF	0.22	
C105	ECUV1H470JCV	47P	
C113	ECEA1CKA100	10	
C121	PSCU2JW101KR	100P	
C122	PSCU2JW101KR	100P	
C125	ECUV1C104KBV	0.1	
C126	ECUV1C104KBV	0.1	
C127	ECEA0JKA221	220	
C129	ECUV1H682KBV	0.0068	
C130	ECEA0JKA331	330	
C131	ECUV1H101JCV	100P	
C141	ECUV1C104KBV	0.1	
C142	ECUV1C104KBV	0.1	
C143	ECUV1C104ZFV	0.1	
C144	ECUV1H220JCV	22P	
C150	ECUV1H471JCV	470P	S
C151	ECST0JY106	10	
C160	ECUV1H103KBV	0.01	S
C161	ECEA1CKA100	10	
C162	ECUV1H101JCV	100P	
C163	ECUV1H103KBV	0.01	
C165	ECEA0JKA331	330	
C166	PQCUV1E333MD	0.033	S
C167	ECEA1CKA100	10	
C168	ECEA1HKA010	1	
C169	ECUV1H222KBV	0.0022	
C170	ECUV1H151JCV	150P	
C171	ECEA1HKA010	1	
C173	ECUV1C273KBV	0.027	
C176	ECUV1H270JCV	27P	
C178	ECUV1H272KBV	0.0027	
C179	ECUV1A105ZFV	1	
C181	ECUV1H470JCV	47P	
C182	ECUV1H821JCV	820P	
C183	ECUV1C273KBV	0.027	
C184	ECUV1H332KBV	0.0033	
C186	ECEA1HKA010	1	
C188	ECST0JY106	10	
C189	ECUV1H101JCV	100P	
C191	ECUV1C104ZFV	0.1	
C192	ECUV1H101JCV	100P	
C197	ECUV1C104KBV	0.1	

Ref. No.	Part No.	Part Name & Description	Remarks
C201	ECUV2H681KB	680P	S
C202	ECUV2H681KB	680P	S
C203	ECQE2224KF	0.22	
C205	ECUV1H470JCV	47P	
C212	PQCUV1E333MD	0.033	S
C213	ECEA1CKA100	10	
C221	PSCU2JW101KR	100P	
C222	PSCU2JW101KR	100P	
C225	ECUV1C104KBV	0.1	
C226	ECUV1C104KBV	0.1	
C227	ECUV1H471JCV	470P	S
C228	ECEA0JKA221	220	
C229	ECUV1H682KBV	0.0068	
C241	ECUV1C104KBV	0.1	
C242	ECUV1C104KBV	0.1	
C243	ECUV1C104ZFV	0.1	
C244	ECUV1H220JCV	22P	
C250	ECUV1H471JCV	470P	S
C251	ECST0JY106	10	
C258	ECUV1H270JCV	27P	
C259	ECUV1H222KBV	0.0022	
C260	ECUV1H103KBV	0.01	S
C261	ECEA1CKA100	10	
C262	ECUV1H101JCV	100P	
C263	ECUV1H103KBV	0.01	
C264	ECEA1CKA100	10	
C265	ECEA1HKA010	1	
C266	ECEA0JKA331	330	
C267	ECUV1C104ZFV	0.1	
C268	ECEA1HKA010	1	
C269	ECUV1H101JCV	100P	
C270	ECUV1A224KBV	0.22	
C271	ECEA1HKA010	1	
C272	ECUV1H562KBV	0.0056	
C273	ECUV1C104KBV	0.1	
C275	ECUV1H471JCV	470P	S
C276	ECUV1H333KBV	0.033	S
C277	ECEA0JKA331	330	
C278	ECUV1H102KBV	0.001	
C279	ECUV1A105ZFV	1	
C280	ECUV1H222KBV	0.0022	
C281	ECUV1H101JCV	100P	
C283	ECUV1H270JCV	27P	
C285	ECUV1H272KBV	0.0027	
C286	ECST0JY106	10	
C287	ECUV1H222KBV	0.0022	
C288	ECUV1H101JCV	100P	
C291	ECUV1C104ZFV	0.1	
C292	ECUV1H471JCV	470P	S
C293	ECUV1H222KBV	0.0022	
C297	ECUV1C104KBV	0.1	
C298	ECUV1C104KBV	0.1	
C299	ECST0JY106	10	
C302	ECUV1C104ZFV	0.1	

Ref. No.	Part No.	Part Name & Description	Remarks
C303	ECUV1C104ZFV	0.1	
C304	ECA1AM102	0.001	
C305	ECUV1C104ZFV	0.1	
C306	ECUV1C104ZFV	0.1	
C307	ECEA0JKS220	22	S
C308	ECEV0JA101	100	
C311	ECUV1C104ZFV	0.1	
C315	ECEA0JKA101	100	
C316	ECUV1C104ZFV	0.1	
C317	ECEA0JU102	1000	
C318	ECUV1C104ZFV	0.1	
C322	ECEA0JKA331	330	
C324	ECST0JY106	10	
C325	ECUV1C104ZFV	0.1	
C326	ECUV1C104ZFV	0.1	
C333	ECUV1H103KBV	0.01	
C334	ECUV1C104KBV	0.1	
C341	PQCUV1A105KB	1	
C342	ECUV1H102KBV	0.001	
C371	ECUV1C104ZFV	0.1	
C391	ECEA1AKA101	100	
C400	ECUV1C563KBV	0.056	
C418	ECUV1H333KBV	0.033	S
C419	ECUV1H333KBV	0.033	S
C420	ECUV1H470JCV	47P	
C421	ECUV1H470JCV	47P	
C425	ECUV1A224KBV	0.22	
C426	ECUV1A224KBV	0.22	
C430	ECEA0JKS220	22	S
C502	ECUV1A105ZFV	1	
C503	ECST0JY106	10	
C504	ECUV1A105ZFV	1	
C508	ECST0JY106	10	
C509	ECUV1C104ZFV	0.1	
C510	ECUV1C104ZFV	0.1	
C511	ECUV1C104ZFV	0.1	
C551	ECUV1H103KBV	0.01	S
C552	ECUV1H103KBV	0.01	S
C553	ECUV1H103KBV	0.01	S
C554	ECUV1C104ZFV	0.1	
C560	ECST0JY106	10	
C570	ECUV1H103KBV	0.01	S
C571	ECUV1H103KBV	0.01	S
C572	ECUV1H103KBV	0.01	S
C573	ECUV1H103KBV	0.01	S
C581	ECUV1C104ZFV	0.1	
C591	ECST0JY106	10	
C592	ECUV1C104ZFV	0.1	
C606	ECEA0JKA101	100	
C607	ECUV1H103KBV	0.01	S
C608	ECUV1H103KBV	0.01	S
C609	ECUV1C104ZFV	0.1	
C620	ECUV1H471JCV	470P	S
C621	ECUV1H121JCV	120P	

Ref. No.	Part No.	Part Name & Description	Remarks
C622	ECUV1H331JCV	330P	S
C701	ECUV1C104ZFV	0.1	
C721	ECUV1A474KBV	0.47	
C722	ECUV1C104ZFV	0.1	
C723	ECUV1C104ZFV	0.1	
C724	ECUV1C104ZFV	0.1	
C725	ECUV1C104ZFV	0.1	
C726	ECUV1C104ZFV	0.1	
C727	ECUV1A474KBV	0.47	
C728	ECUV1A474KBV	0.47	
C801	ECUV1C104ZFV	0.1	
C802	ECST0JY106	10	

23.1.3. RF P.C.BOARD PART

Ref. No.	Part No.	Part Name & Description	Remarks
PCB2	PQLP10233Z	RF BLOCK	

23.2. Handset

23.2.1. CABINET AND ELECTRICAL PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
101	PQADGP0831GN	LIQUID CRYSTAL DISPLAY	S
102	PQAX2P06Z	SPEAKER	
103	PQBC10294X1	NAVIGATOR BUTTON	S
104	PQGP10165Z1	LCD PANEL	S
105	PQGT14077Z	NAME PLATE	
106	PQHG10527Y	RUBBER SHEET	
107	PQHR10726Z	LCD HOLDER	
108	PQHR10727Z	LCD PLATE	
109	PQHR10739Z	SP HOLDER	
110	PQHS10410W	DOUBLE SIDE TAPE	S
111	PQHS10425Z	SP SPONGE	
112	PQHX10862Z	LCD COVER SHEET	
113	PQHX10955Z	LCD SHEET	
114	PQHX10959Z	CUSHION	
115	PQJT10158Z	CHARGE TERMINAL (L)	
116	PQJT10159Z	CHARGE TERMINAL (R)	
117	PQKE10099Z1	EARPHONE CAP	S
118	PQKF10312Z1	REAR CABINET	S
119	PQKK10099Z1	BATTERY COVER	S
120	PQKM10417T4	FRONT CABINET	S
121	PQP508SVC	BATTERY	S
122	PQSA10102X	ANTENNA	S
123	PQSX10141Z	RUBBER SWITCH	
124	PQHX10934Z	SHEET	
125	PQQT22108Z	PRODUCTION LABEL	
126	PQHG10602Y	RUBBER	

23.2.2. MAIN P.C. BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB100	PQWPTC1891BR	MAIN P.C.BOARD ASS'Y (RTL)	
		(ICS)	
IC201	C2HBBH000021	IC	
IC202	PQWITC1891BR	IC	
IC203	PQVIC62FP33M	IC	S
IC204	PQVIXCP3002M	IC	S
IC205	PQVIC61CN32N	IC	S
		(TRANSISTORS)	
Q201	PQVTDTC143E	TRANSISTOR(SI)	S
Q202	PQVTDTC143E	TRANSISTOR(SI)	S
Q203	PQVTDTA143TU	TRANSISTOR(SI)	
Q204	2SA1797Q	TRANSISTOR(SI)	S
Q205	2SD1819A	TRANSISTOR(SI)	
Q206	PQVTDTC143E	TRANSISTOR(SI)	S
Q207	2SD1819A	TRANSISTOR(SI)	
Q208	PQVTD123T146	TRANSISTOR(SI)	S
Q209	PQVTD123T146	TRANSISTOR(SI)	S
Q210	UN521	TRANSISTOR(SI)	
Q211	PQVTDTA143TU	TRANSISTOR(SI)	
		(DIODES)	
D201	MA2ZD1400	DIODE(SI)	
D202	MA2ZD1400	DIODE(SI)	
D203	MA111	DIODE(SI)	
D206	PQVDS1ZB60F1	DIODE(SI)	S
D209	MA111	DIODE(SI)	
D210	MA111	DIODE(SI)	
D212	MA8150	DIODE(SI)	
D213	MA8150	DIODE(SI)	
		(LEDS)	
LED201	PQVDSML310MT	LED	S
LED202	PQVDSML310MT	LED	S
LED203	PQVDSML310MT	LED	S
LED204	PQVDSML310MT	LED	S
LED205	PQVDSML310MT	LED	S
LED206	PQVDSML310MT	LED	S
LED207	PQVDSML310MT	LED	S
		(CONNECTORS)	
CN201	PQJS22B11Z	FPC CONNECTOR	
CN202	PQJP2D13Z	CONNECTOR	S
CN203	PQJJ1J007Z	EARJACK	S
		(COILS)	
L201	MQLRE15NJF	COIL	
L203	PQLQR3FL121	COIL	S
L204	PQLQR3FL121	COIL	S
L205	PQLQR3FL121	COIL	S
		(OTHERS)	
E101	PQEFBC12111B	RINGER	S
E102	PQJM147Y	MICROPHONE	S
G1	PQJT10152Z	CHARGE TEMRINAL	
G2	PQJT10152Z	CHARGE TEMRINAL	
G3	PQJT10152Z	CHARGE TEMRINAL	
G4	PQJT10152Z	CHARGE TEMRINAL	
G5	PQJT10152Z	CHARGE TEMRINAL	
G6	PQJT10152Z	CHARGE TEMRINAL	

Ref. No.	Part No.	Part Name & Description	Remarks
X201	PQVCI4096N3Z	CRYSTAL OSCILLATOR	
		(RESISTORS)	
R201	ERJ3GEYJ331	330	
R202	ERJ3GEYJ331	330	
R203	ERJ3GEYJ331	330	
R204	ERJ3GEYJ331	330	
R205	ERJ3GEYJ101	100	
R206	ERJ3GEYJ101	100	
R207	ERJ3GEYJ101	100	
R209	ERJ3GEYJ104	100k	
R210	ERJ3GEYJ104	100k	
R211	ERJ3GEYJ104	100k	
R212	ERJ3GEYJ101	100	
R213	ERJ3GEYJ101	100	
R217	ERJ3GEYF434	430k	S
R218	ERJ3GEYF824	820k	S
R220	ERJ3GEYJ474	470k	
R221	ERJ3GEYJ103	10k	
R222	ERJ3GEYJ101	100	
R223	ERJ3GEY0R00	0	
R224	ERJ3GEYJ103	10k	
R225	ERJ3GEYJ472	4.7k	
R226	ERJ3GEYJ123	12k	
R227	ERJ3GEYJ473	47k	
R228	ERJ3GEYJ224	220k	
R229	ERJ3GEYJ102	1k	
R230	ERJ3GEYJ102	1k	
R231	ERJ3GEYJ102	1k	
R232	ERJ3GEYJ103	10k	
R233	ERJ3GEY0R00	0	
R234	ERJ3EKF2204	2.2M	
R235	ERJ3EKF2204	2.2M	
R236	ERJ3GEYJ102	1k	
R241	ERJ3GEY0R00	0	
R242	ERJ3GEYJ180	18	
R243	ERJ3GEYJ180	18	
R244	ERJ3GEYJ473	47k	
R245	ERJ3GEYJ103	10k	
R246	ERJ3GEYJ153	15k	
R247	ERJ3GEYJ391	390	
R248	ERJ3GEYJ393	39k	
R249	ERJ3GEYJ222	2.2k	
R250	ERJ3GEYJ222	2.2k	
R251	ERJ3GEYJ120	12	
R252	ERJ3GEYJ221	220	
R253	ERJ3GEYJ222	2.2k	
R260	ERJ3GEYJ104	100k	
R263	ERJ3GEYJ104	100k	
R264	ERJ3GEYJ103	10k	
R265	ERJ3GEYJ103	10k	
C202	ERJ3GEY0R00	0	
C204	ERJ3GEYJ104	100k	
		(CAPACITORS)	
C203	ECUV1C104ZFV	0.1	

Ref. No.	Part No.	Part Name & Description	Remarks
C205	ECUV1H101JCV	100P	
C206	ECUV1C104KBV	0.1	
C207	ECUV1C104KBV	0.1	
C208	ECUV1C104KBV	0.1	
C209	ECUV1C104KBV	0.1	
C210	ECUV1C104KBV	0.1	
C211	ECUV1A474KBV	0.47	S
C212	ECUV1A474KBV	0.47	S
C213	ECEV1AA221	220	
C214	ECUV1H103KBV	0.01	
C215	ECUV1A474KBV	0.47	S
C217	ECUV1C104ZFV	0.1	
C218	ECUV1C104ZFV	0.1	
C219	ECUV1H470JCV	47P	
C220	ECEV0JA101	100	
C221	ECUV1C104ZFV	0.1	
C222	ECUV1C104ZFV	0.1	
C223	ECST0JY106	10	
C224	ECUV1C104ZFV	0.1	
C226	ECUV1C104ZFV	0.1	
C227	ECUV1H470JCV	47P	
C228	ECUV1C104ZFV	0.1	
C229	ECUV1C104ZFV	0.1	
C230	ECUV1C104KBV	0.1	
C231	ECUV1A224KBV	0.22	
C232	ECUV1C104KBV	0.1	
C233	ECUV1C104ZFV	0.1	
C234	ECUV1A224KBV	0.22	
C236	ECUV1H060DCV	6P	S
C237	ECUV1H060DCV	6P	S
C239	ECUV1H103KBV	0.01	
C249	ECST0GY226	22	
C255	ECUV1A224KBV	0.22	
C267	ECST0JX226	22	
C269	ECUV1H330JCV	33P	
C270	ECST0JY475	4.7	
C274	ECUV1C104ZFV	0.1	
C277	ECUV1C563KBV	0.056	
C279	ECUV1H010CCV	1P	
C280	ECUV1C104ZFV	0.1	
C284	ECUV1H330JCV	33P	
C286	ECUV1H330JCV	33P	
C287	ECUV1C104ZFV	0.1	
C288	ECUV1H330JCV	33P	
C289	ECUV1H330JCV	33P	
C290	ECUV1H102KBV	0.001	
C291	ECUV1H102KBV	0.001	
C292	ECUV1H330JCV	33P	
C294	ECUV1H103KBV	0.01	

23.2.3. RF P.C.BOARD PART

Ref. No.	Part No.	Part Name & Description	Remarks
PCB200	PQLP10233Z	RF BLOCK	

23.2.4. ACCESSORIES AND PACKING MATERIALS

Ref. No.	Part No.	Part Name & Description	Remarks
A1	PQLV1Z	AC ADAPTOR	⚠
A2	PQJA10075Z	TEL CORD	
A3	PQKE10097Z1	HANDSET HOLDER	S
A4	PQKE10098Z1	BELT CLIP	S
A5	PQKL10035Z1	WALL MOUNT	S
A6	PQHG10592Z	CUSHION RUBBER	
A7	PQQW12274Z	QUICK GUIDE (for English)	
A8	PQQW12275Z	QUICK GUIDE (for Spanish)	
A9	PQQX12791Z	INSTRUCTION BOOK	
A10	PQQW12298Z	LEAFLET HS	
A11	PQJA10088Z	TEL CORD	
P1	PQPH89Y	PROTECTION COVER	
		(for Base Unit)	
P2	XZB10X35A02	PROTECTION COVER	
		(for Handset)	
P3	PQPK13169Z	GIFT BOX	

24. FOR SCHEMATIC DIAGRAM

24.1. Base Unit (SCHEMATIC DIAGRAM (Base Unit))

Notes:

1. DC voltage measurements are taken with voltmeter from the negative voltage line.

> Important Safety Notice:
> Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only the manufacturer's specified parts.

This schematic diagram may be modified at any time with the development of new technology.

24.2. Handset (SCHEMATIC DIAGRAM (Handset))

Notes:

1. DC voltage measurements are taken with an oscilloscope or a tester with a ground.

2. The schematic diagrams and circuit board may be modified at any time with the development of new technology.

25. CIRCUIT BOARD (RF Unit)

26. SCHEMATIC DIAGRAM (RF Unit)

27. CIRCUIT BOARD (Base Unit)

27.1. Component View

27.2. Flow Solder Side View

28. SCHEMATIC DIAGRAM (Base Unit)

29. CIRCUIT BOARD (Handset)

30. SCHEMATIC DIAGRAM (Handset)

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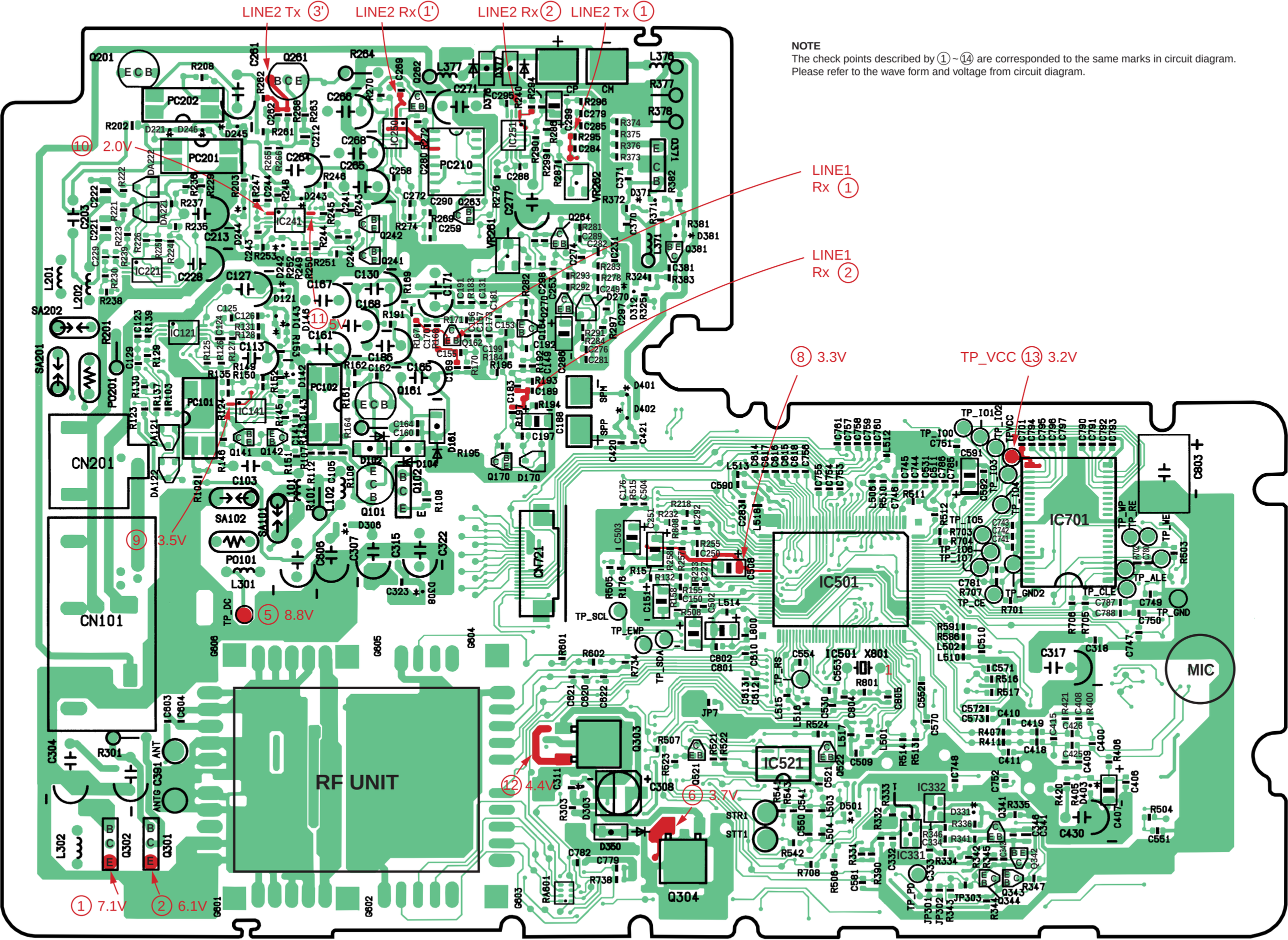
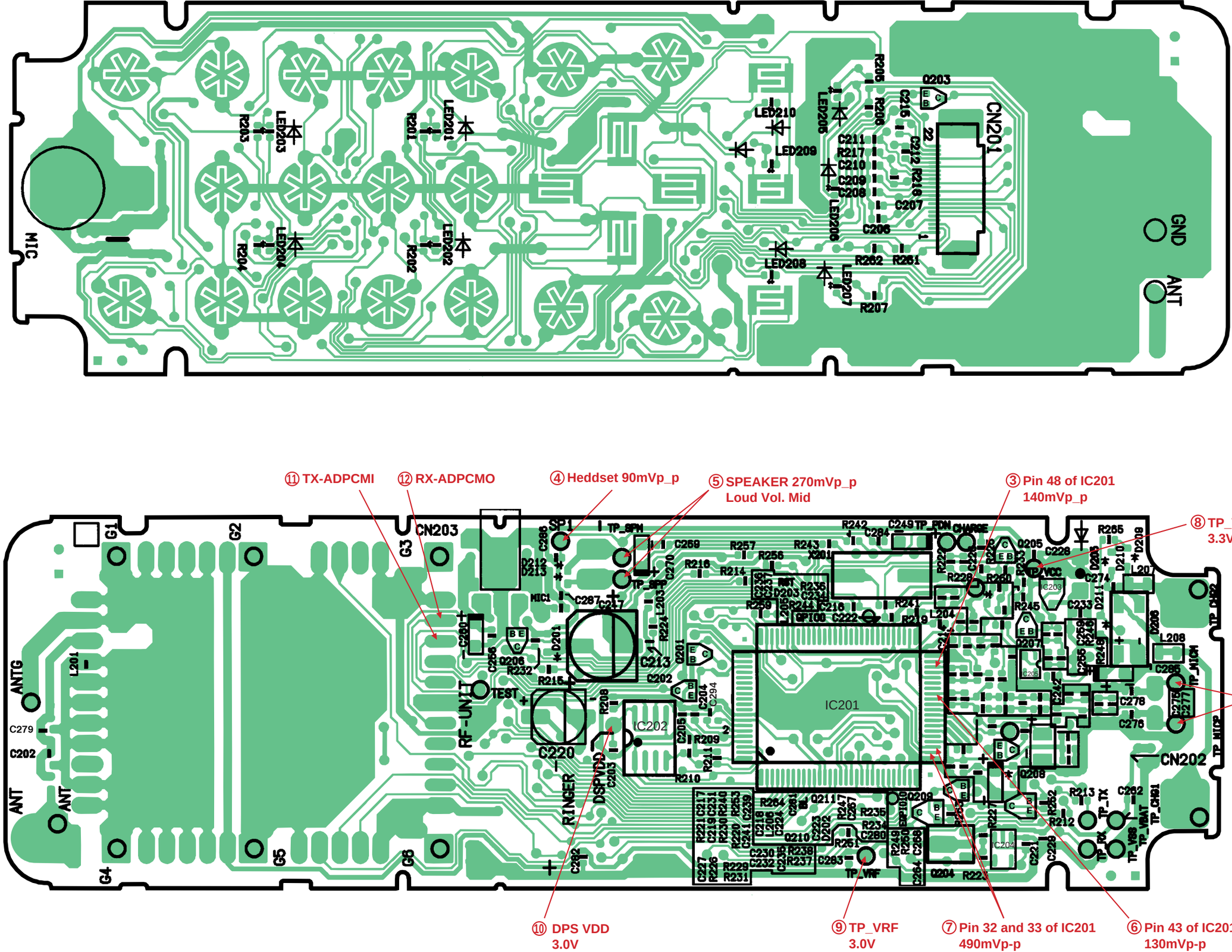
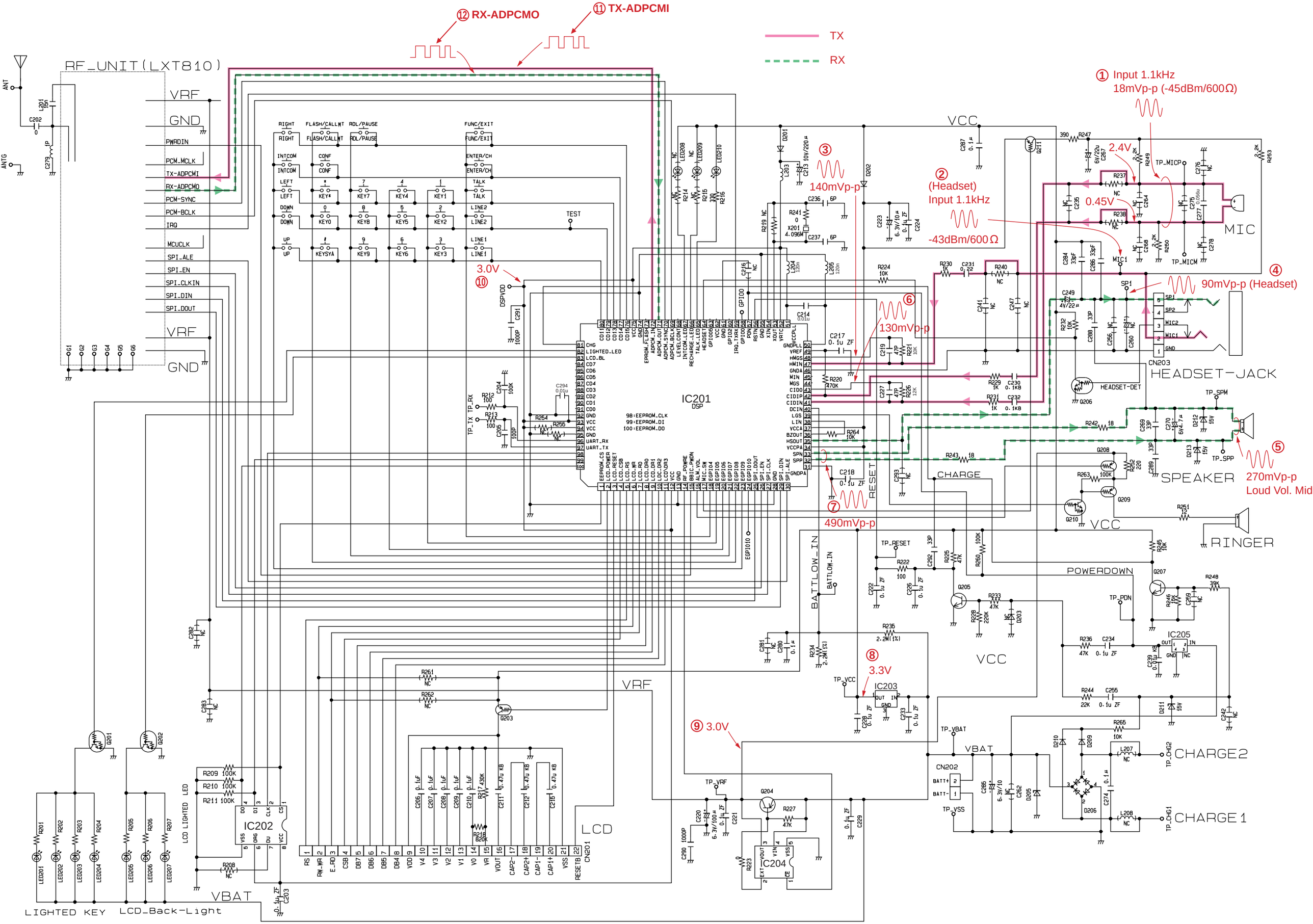
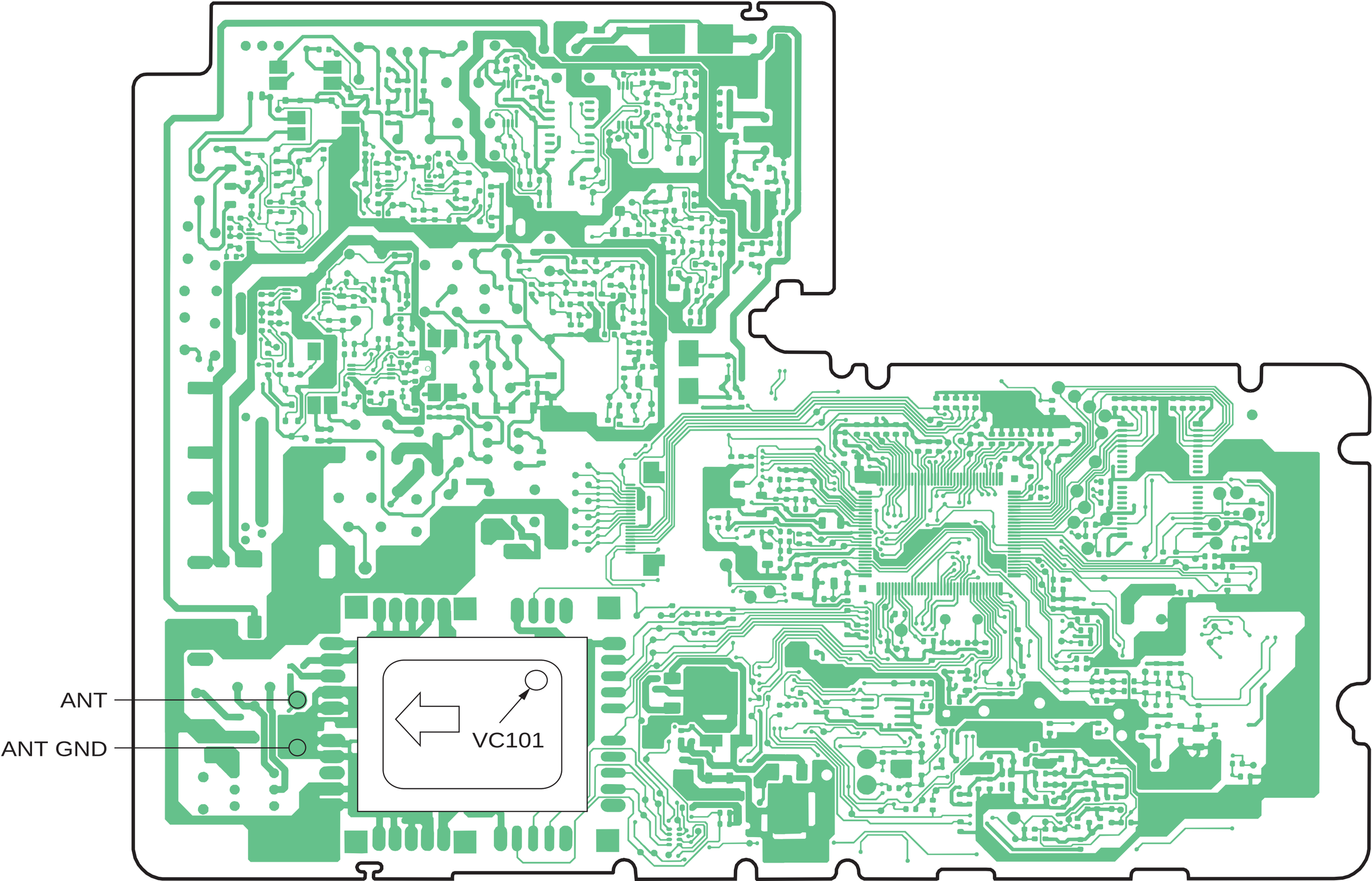


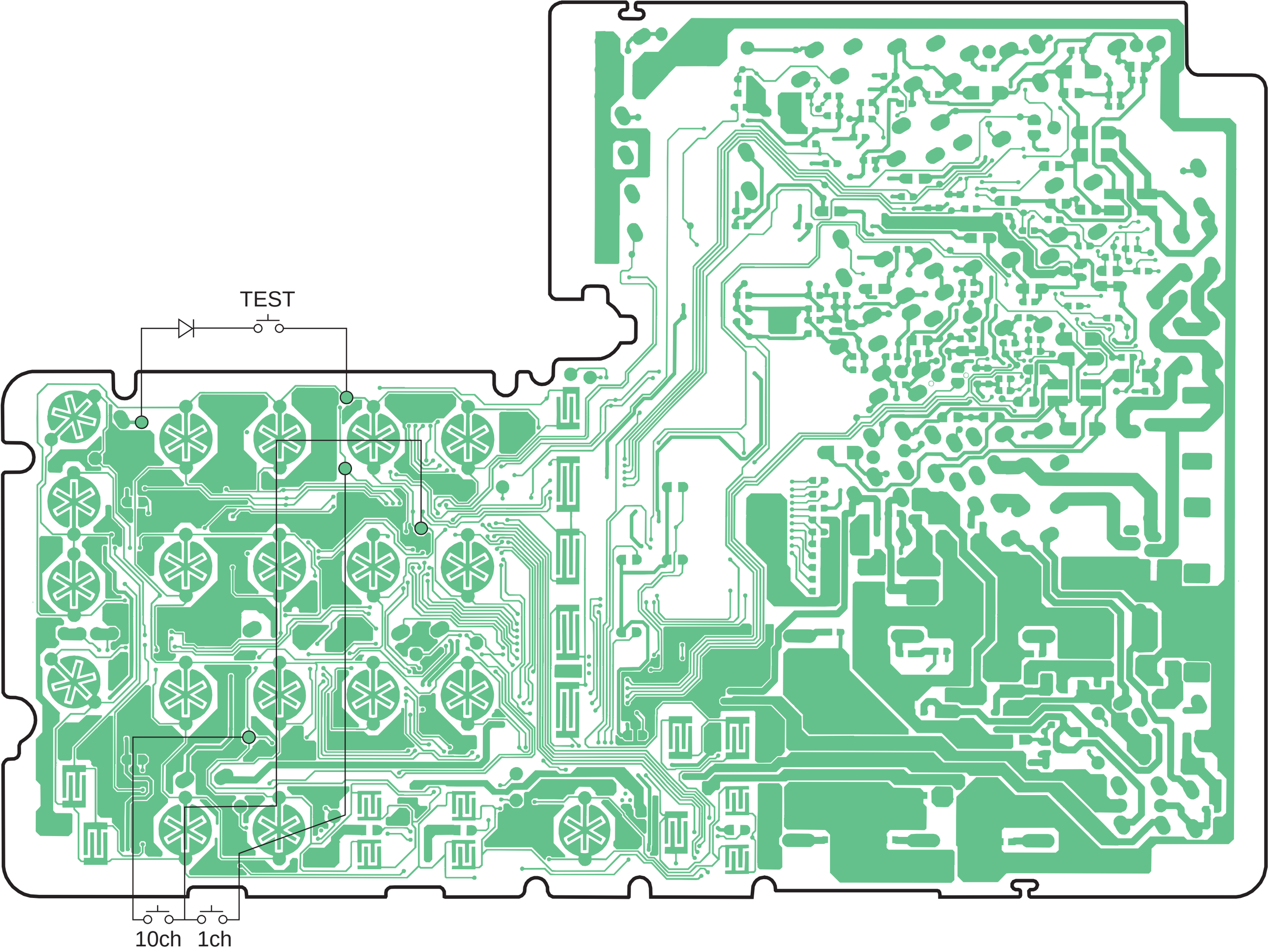
NOTE

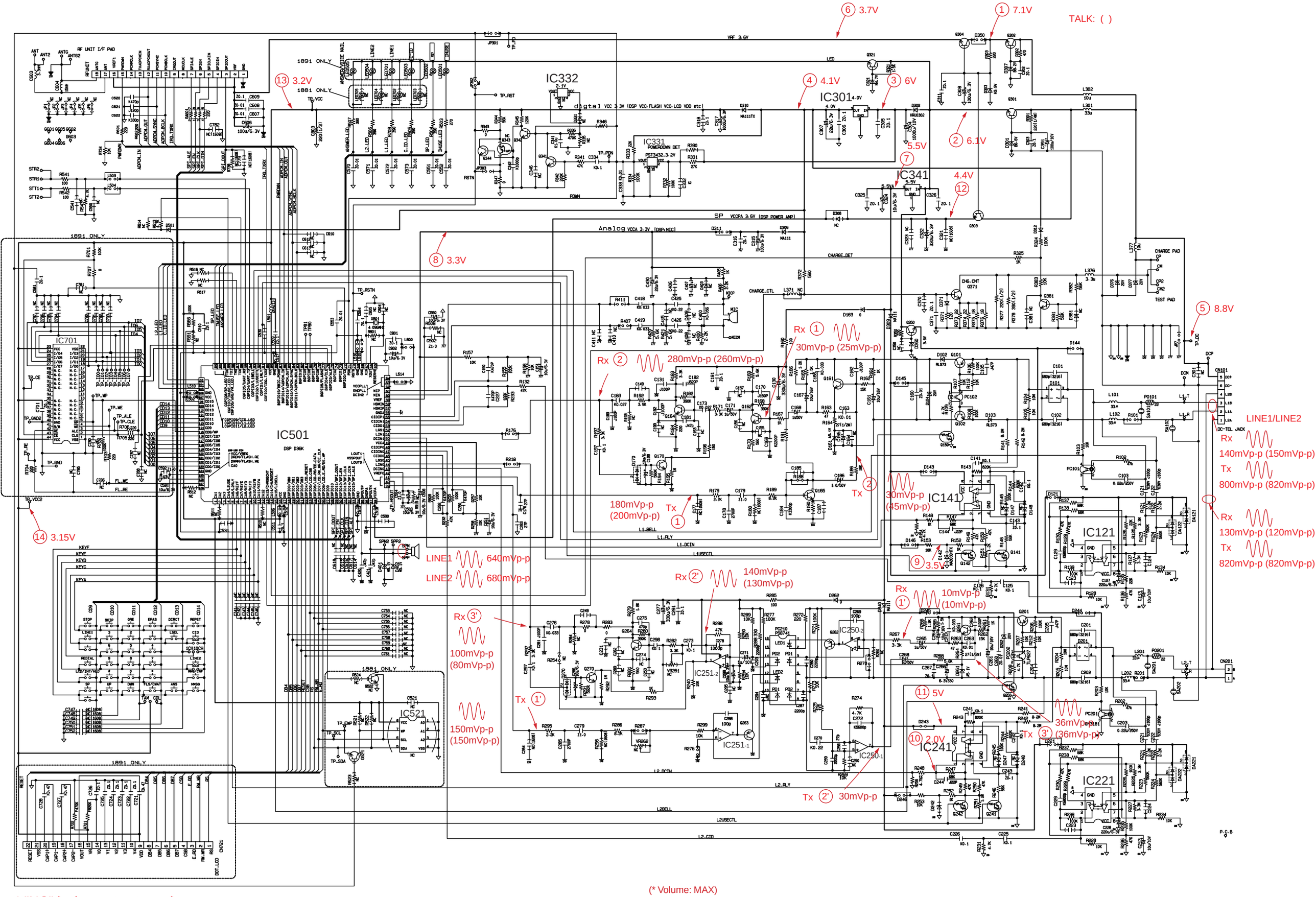
The check points described by ① ~ ⑭ are corresponded to the same marks in circuit diagram.
Please refer to the wave form and voltage from circuit diagram.


⑪ TX-ADPCMI
⑫ RX-ADPCMO
④ Heddset 90mVp_p
⑤ SPEAKER 270mVp_p
Loud Vol. Mid
③ Pin 48 of IC201
140mVp_p
⑧ TP_Vcc
3.3V
① INPUT
1.1kHz
18mVp_p
(-45dbm/600Ω)
⑩ DPS VDD
3.0V
⑨ TP_VRF
3.0V
⑦ Pin 32 and 33 of IC201
490mVp-p
⑥ Pin 43 of IC201
130mVp-p
MIC
GND
ANT
CN201
CN203
CN202
IC201
IC202
IC203
IC204
RF-UNIT
RINGER
TEST
ANTG
SP1
TP_SPM
TP_SPP
TP_PDN
CHARGE
TP_VCC
TP_MIC1
TP_MIC2
TP_TX
TP_VBAT
TP_VBS
TP_CN01
DSPVDD
GPIO0
MIC1
RST


⑫ RX-ADPCMO
⑪ TX-ADPCMI
TX
RX
RF_UNIT(LXT810)
VRF
GND
PWRDIN
PCM_MCLK
TX-ADPCMI
RX-ADPCMO
PCM-SYNC
PCM-BCLK
IRQ
MCUCLK
SPI_ALE
SPI_EN
SPI_CLKIN
SPI_DIN
SPI_DOUT
ANT
ANTG
RIGHT
FLASH/CALLWT
RDL/PAUSE
FUNC/EXIT
INTCOM
CONF
ENTER/CH
LEFT
TALK
DOWN
LINE2
UP
LINE1
KEY* KEY7 KEY4 KEY1
KEY0 KEY8 KEY5 KEY2
KEYSYA KEY9 KEY6 KEY3
TEST
3.0V
⑩
DSPVDD
IC201
DSP
VCC
① Input 1.1kHz
18mVp-p (-45dBm/600Ω)
② (Headset)
Input 1.1kHz
-43dBm/600Ω
③
140mVp-p
2.4V
0.45V
MIC
TP_MICP
TP_MICM
MIC1
④ 90mVp-p (Headset)
SP1
SP2
MIC2
MIC1
GND
CN203
HEADSET-JACK
HEADSET-DET
⑥
130mVp-p
⑤
270mVp-p
Loud Vol. Mid
TP_SPM
TP_SPP
SPEAKER
CHARGE
RESET
⑦
490mVp-p
RINGER
TP_RESET
POWERDOWN
TP_PDN
BATTLOW_IN
⑧
3.3V
TP_VCC
IC203
IC205
⑨ 3.0V
TP_VRF
TP_VBAT
VBAT
CN202
BATT+
BATT-
TP_VSS
CHARGE2
CHARGE1
TP_CHG2
TP_CHG1
LCD
IC202
LCD LIGHTED LED
LIGHTED KEY
LCD_Back-Light
VBAT
VRF
IC204
CN201
Q201
Q202
Q203
Q204
Q205
Q206
Q207
Q208
Q209
Q210
Q211
TP_IX TP_RX
9B:EEPROM_CLK
99:EEPROM_DI
100:EEPROM_DO
EGPIO10
RESETB
* "NC" is the part not used.

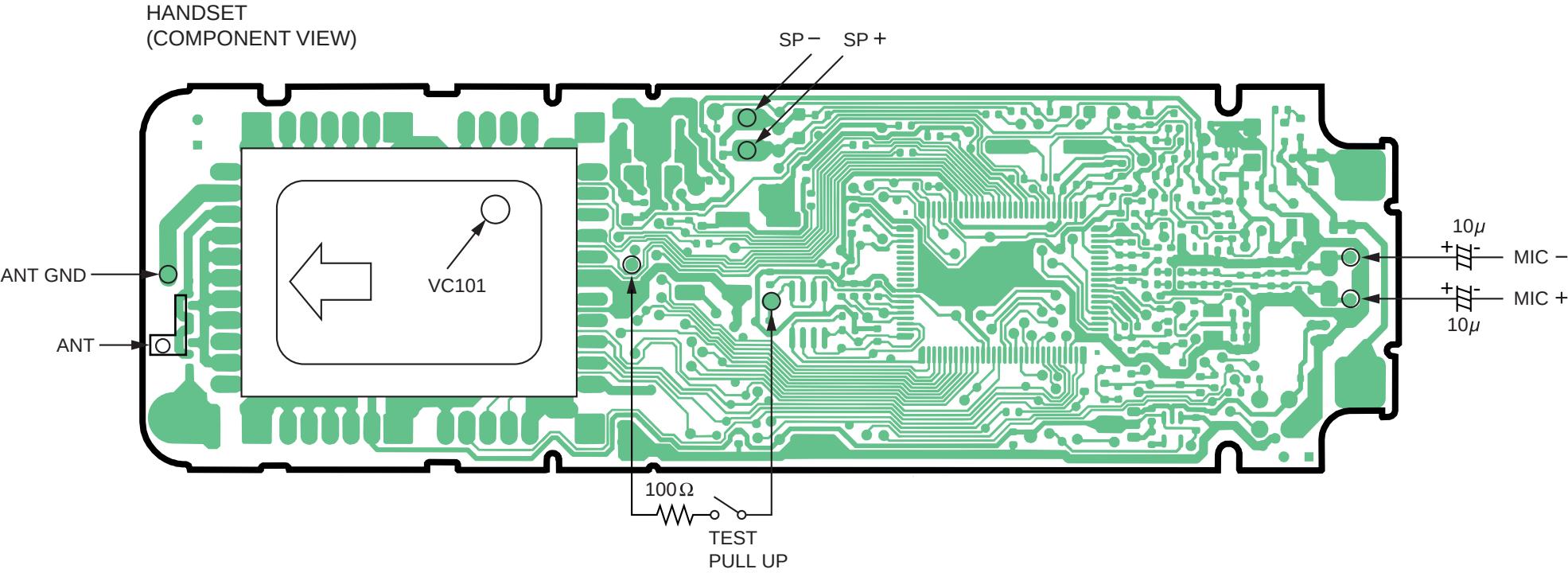

ANT
ANT GND
VC101

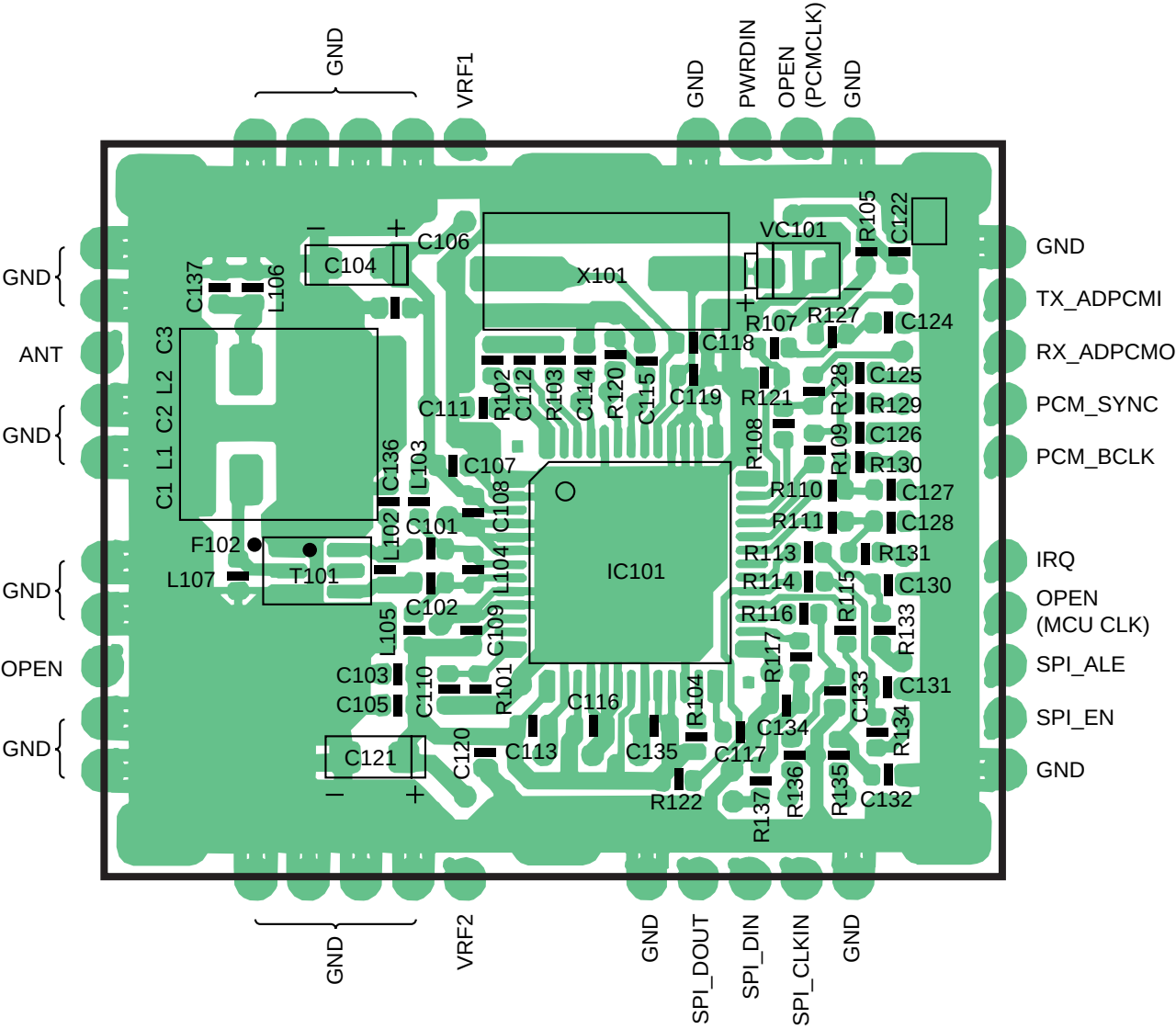

TEST
10ch
1ch

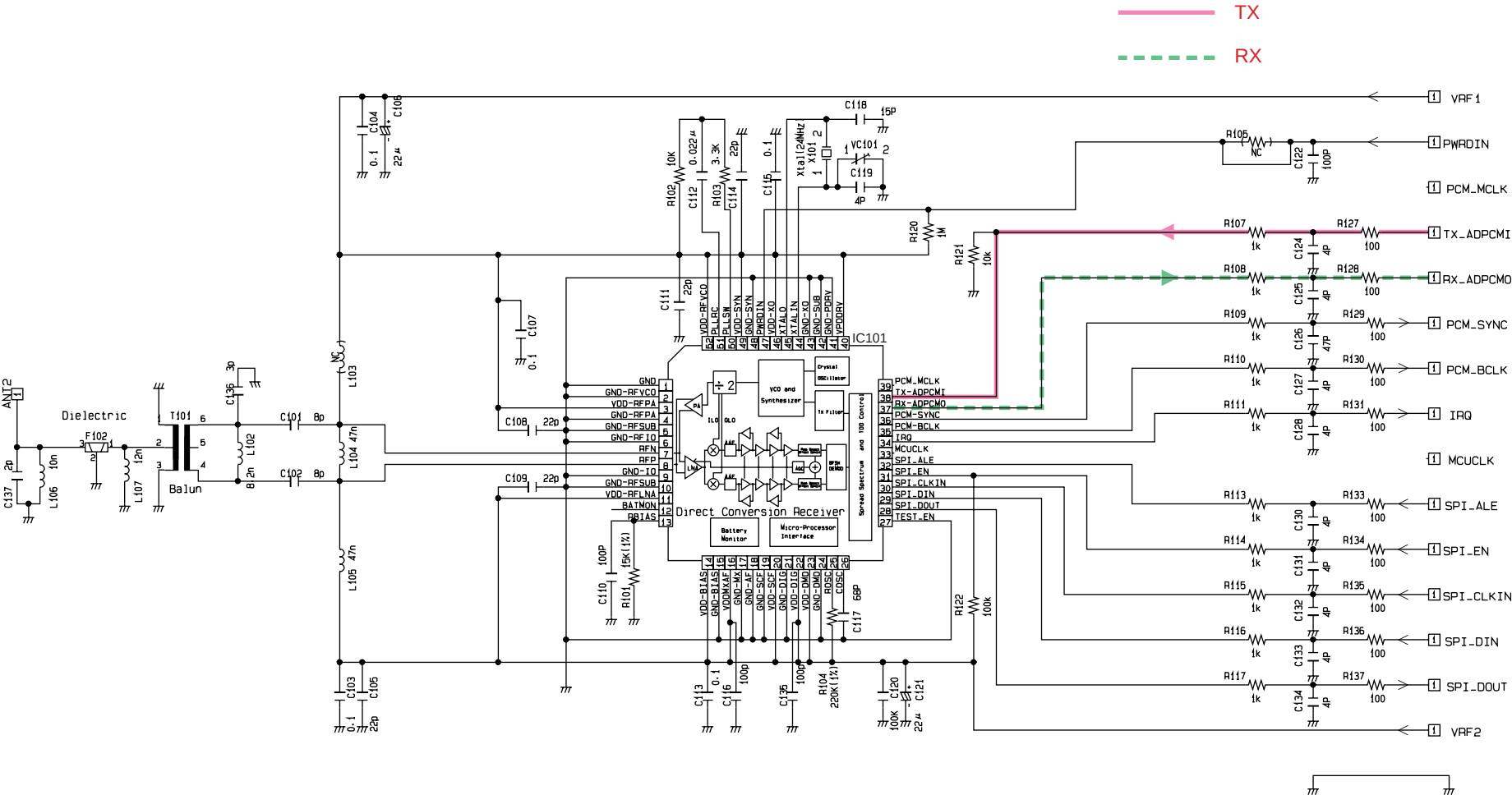


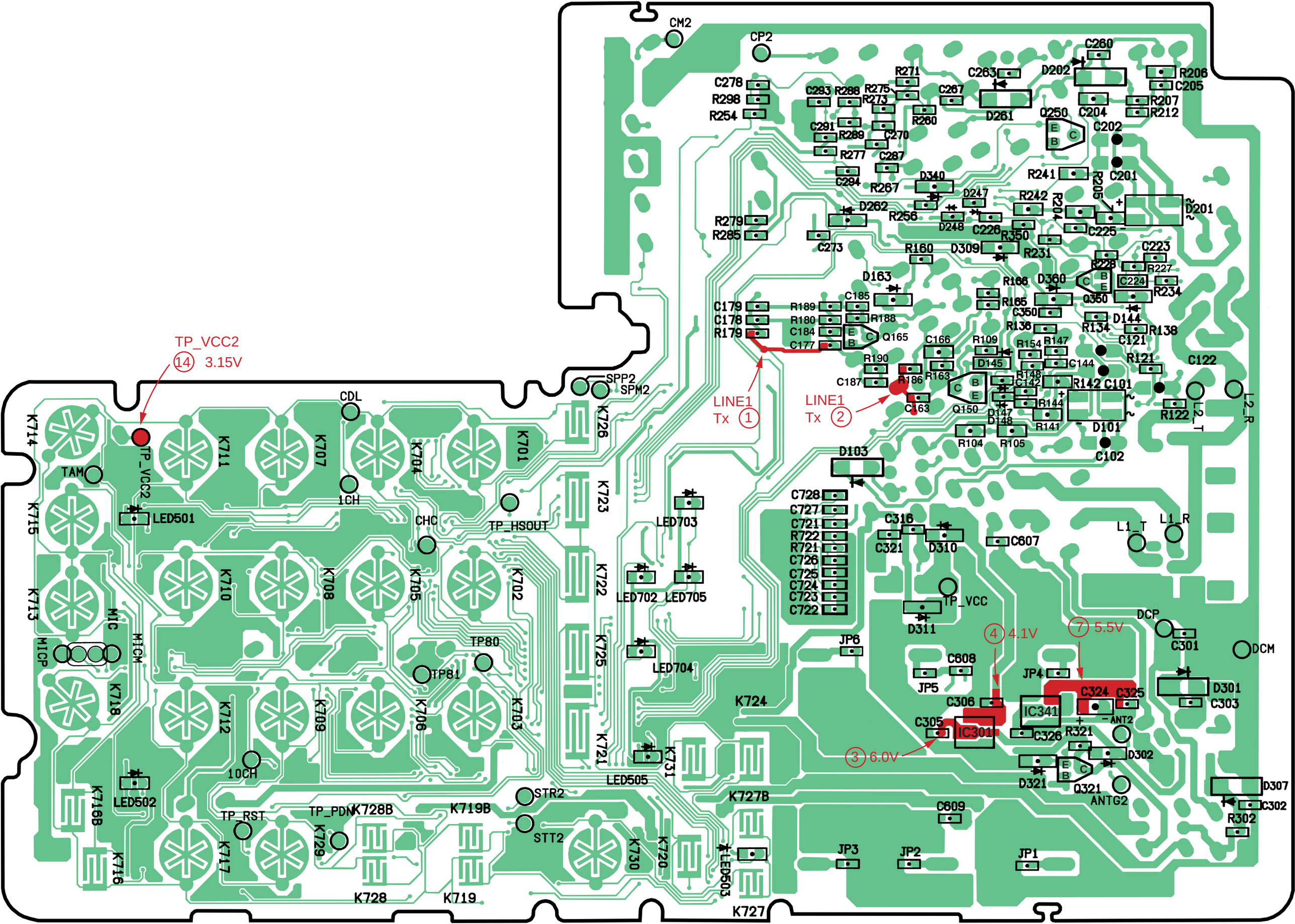
(* Volume: MAX)

* "NC" is the part not used.


HANDSET
(COMPONENT VIEW)
SP −
SP +
ANT GND
ANT
VC101
10μ
MIC −
MIC +
10μ
100Ω
TEST
PULL UP


GND
VRF1
GND
PWRDIN
OPEN (PCMCLK)
GND
GND
TX_ADPCMI
RX_ADPCMO
PCM_SYNC
PCM_BCLK
IRQ
OPEN (MCU CLK)
SPI_ALE
SPI_EN
GND
GND
VRF2
GND
SPI_DOUT
SPI_DIN
SPI_CLKIN
GND
GND
ANT
GND
GND
OPEN
GND
C137
L106
C104
C106
X101
VC101
C122
R105
C124
R127
R107
C118
C125
R128
R121
C119
C111
R102
C112
R103
C114
R120
C115
C129
R129
C126
R108
R109
R130
C136
L103
C107
C108
R110
C127
C1 L1 C2 L2 C3
C101
R111
C128
F102
L102
IC101
R113
R131
L107
T101
L104
R114
C130
C102
R116
R115
L105
C109
R133
C103
C110
R101
R117
C131
C105
C116
R104
C133
C134
C120
C113
C135
C117
R134
C121
R122
R136
R135
C132
R137


TX
RX
ANT2
Dielectric
F102
T101
Balun
L106
L107
L102
L103
L104 47n
L105 47n
C101 8p
C102 8p
C135 3p
C136 3p
C137 2p
C104
C106
C103
C105
C107
C108 22p
C109 22p
C110 100P
R101 15K(1%)
C111 22p
R102 10K
C112 0.022μ
R103 3.3K
C114 22p
C115 0.1
C118 15P
Xtal(24MHz)
X101
VC101
C119 4P
R120 1M
R121 10k
C113 0.1
C116 100p
C117 68P
C175 100p
R104 220K(1%)
C120 100K
C121 22μ
R122 100k
IC101
GND
GND-RFVCO
VDD-RFPA
GND-RFPA
GND-RFSUB
GND-RFIO
RFN
RFP
GND-IO
GND-RFSUB
VDD-RFLNA
BATMON
RBIAS
VDD-RFVCO
PLLRC
PLLSW
VDD-SYN
GND-SYN
PWRDIN
VDD-XO
XTALP
XTALN
GND-SUB
GND-PDRV
VPDRV
PCM_MCLK
TX-ADPCMI
RX-ADPCMO
PCM-SYNC
PCM-BCLK
IRQ
MCUCLK
SPI_ALE
SPI_EN
SPI_CLKIN
SPI_DIN
SPI_DOUT
TEST_EN
VDD-BIAS
GND-BIAS
VDDMAX
GND-MX
GND-AFC
GND-SCP
VDD-SCP
GND-DIG
VDD-DIG
GND-DMD
ROSC
COSC
PA
LNA
ILO
QLO
VCO and Synthesizer
Crystal Oscillator
Tx Filter
Spread Spectrum and TDD Control
Direct Conversion Receiver
Battery Monitor
Micro-Processor Interface
R105 NC
C122 100P
R107 1k
R108 1k
R109 1k
R110 1k
R111 1k
R113 1k
R114 1k
R115 1k
R116 1k
R117 1k
R127 100
R128 100
R129 100
R130 100
R131 100
R133 100
R134 100
R135 100
R136 100
R137 100
C124 4P
C125 4P
C126 47P
C127 4P
C128 4P
C130 4P
C131 4P
C132 4P
C133 4P
C134 4P
VRF1
PWRDIN
PCM_MCLK
TX_ADPCMI
RX_ADPCMO
PCM_SYNC
PCM_BCLK
IRQ
MCUCLK
SPI_ALE
SPI_EN
SPI_CLKIN
SPI_DIN
SPI_DOUT
VRF2


TP_VCC2
14 3.15V
LINE1
Tx 1
LINE1
Tx 2
3 6.0V
4 4.1V
7 5.5V
CM2
CP2
SPP2
SPM2
CDL
1CH
CHC
TP_HSOUT
TP80
TP81
10CH
TP_RST
TP_PDN
STR2
STT2
TAM
MIC
MICM
MICP
LED501
LED502
LED503
LED505
LED702
LED703
LED704
LED705
TP_VCC
JP1
JP2
JP3
JP4
JP5
JP6
DCP
DCM
ANTG2
L1_R
L1_T
L2_R
L2_T
IC301
IC341
Q165
Q150
Q350
Q321
D101
D102
D103
D144
D145
D147
D148
D163
D201
D202
D247
D248
D260
D261
D262
D301
D302
D307
D309
D310
D311
D321
D340
D360
C101
C102
C121
C122
C144
C147
C148
C150
C160
C163
C164
C165
C166
C177
C178
C179
C184
C185
C187
C188
C189
C201
C202
C204
C205
C206
C207
C212
C223
C224
C225
C226
C227
C228
C234
C250
C267
C270
C273
C277
C287
C288
C289
C291
C293
C294
C301
C303
C305
C306
C316
C321
C324
C325
C326
C350
C607
C608
C609
C721
C722
C723
C724
C725
C726
C727
C728
R104
R105
R109
R121
R122
R134
R136
R138
R141
R142
R144
R148
R154
R160
R163
R165
R166
R179
R180
R186
R188
R189
R190
R204
R205
R206
R207
R212
R231
R234
R241
R242
R254
R256
R260
R267
R271
R273
R275
R277
R279
R285
R288
R289
R298
R302
R321
R350
R721
R722
K701
K702
K703
K704
K705
K706
K707
K708
K709
K710
K711
K712
K713
K714
K715
K716
K716B
K717
K718
K719
K719B
K720
K721
K722
K723
K724
K725
K726
K727
K727B
K728
K728B
K729
K730
K731